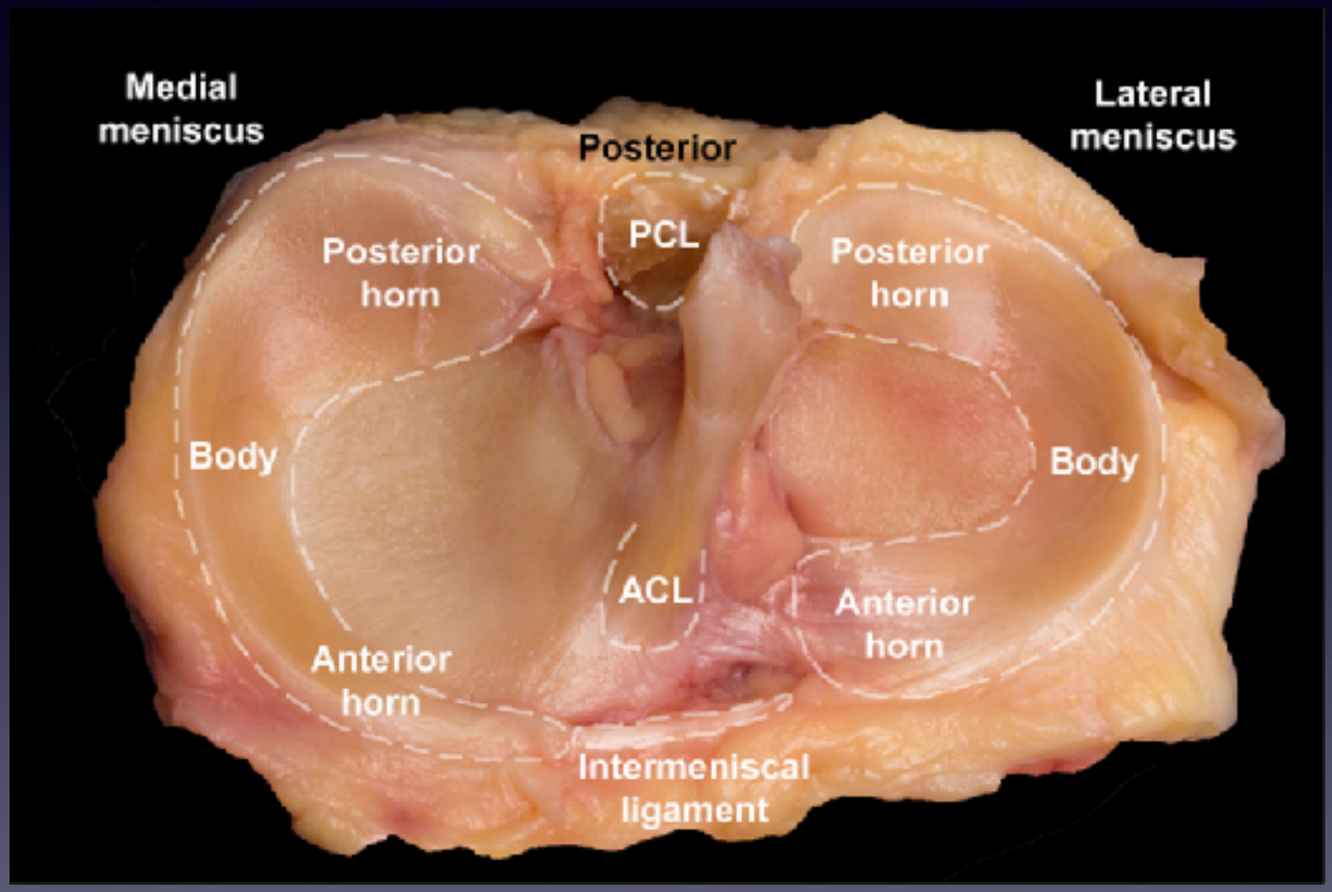
Update on Meniscal Tears, Femoro-acetabular Impingement, Extra-articular Reconstructions

Anthony Leong

Update on Meniscal Tears

Menisci

- Fibrocartilage
- Provide 60% of contact area between femoral condyles and tibial plateau
- Transmit >50% of total axial load in extension
- In 90 degrees of flexion, transmit 85% of the load



Meniscal Tears

- Degenerate
    - Over 40yrs
    - Little or no trauma
- Traumatic
    - Younger patient
    - Major incident

Meniscal Tear
Clinical Presentation

- Acute pain starting immediately of within 48hrs of first noticing symptoms
- Pain can be very severe
- Localised pain to joint line
- Unable to sleep
- Do not like touching knees together
- Swelling/giving way/catching/locking

Meniscal Tear
Clinical Presentation

- Symptoms can often worsen over following 6 weeks, especially if they stay walking
- Examination
  - Effusion
  - Joint line tenderness
  - Limited ROM by effusion +/- locked meniscus
  - +ve McMurray's test

Investigations

- Xray
- MRI

- Not Ultrasound (except if there is suspicion of DVT)

Treatment Options

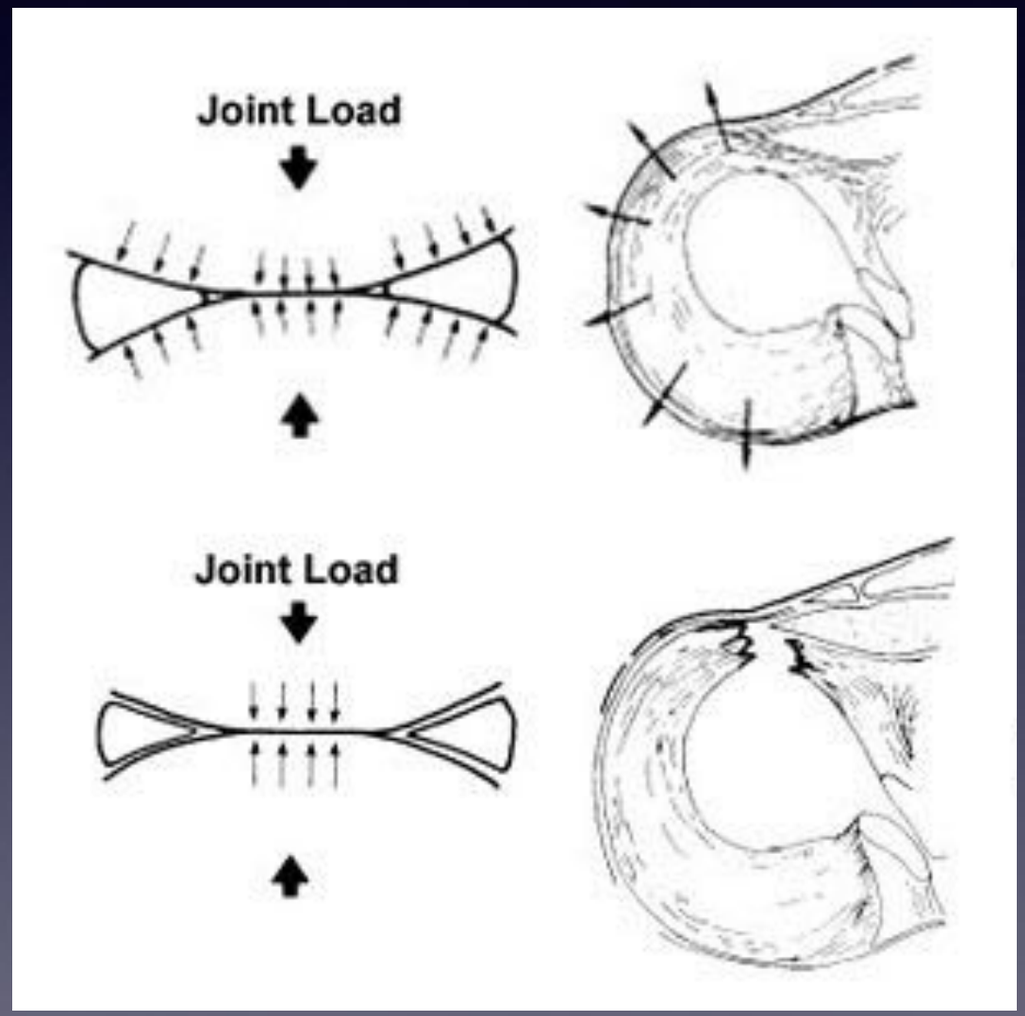
- Rest/exercise/analgesia/NSAIDs
- C.steroid injection
- Arthroscopic Repair/Resection
- Osteotomy/Arthroplasty

Result of Meniscal Tears

- Meniscal tears and menisectomy (total or partial) can increase peak contact pressure in articular cartilage by 3.5X

- Medial meniscal tear results in an increased AP translation of the tibia on the femur by 60% in an ACL deficient knee

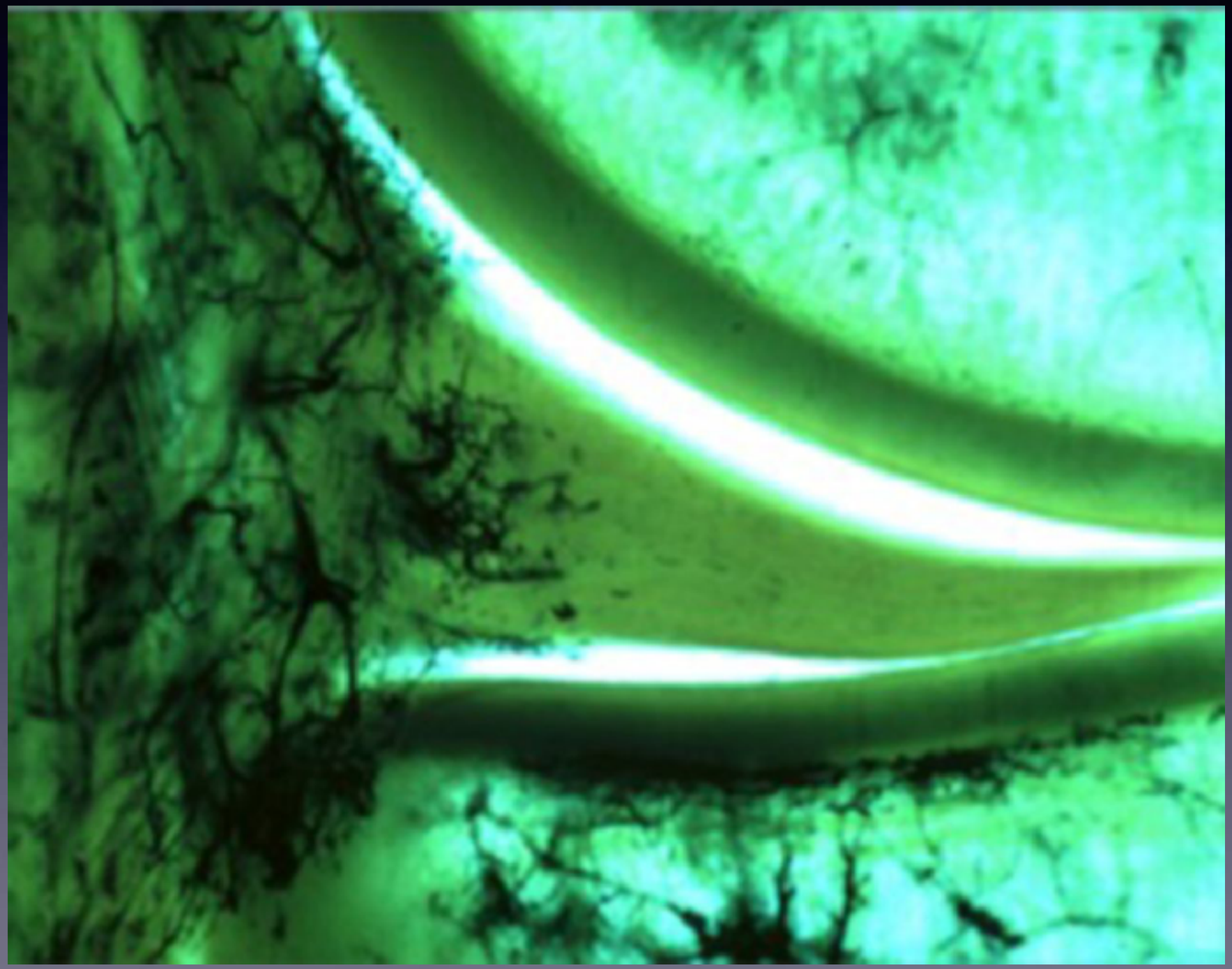
- Long term result - OA of effected compartment (because of combined compressive loads and shear stresses across articular cartilage)



Meniscal Tear Classifications

- Traumatic or Degenerate
- Tear Pattern
- Vascular or Avascular Zone

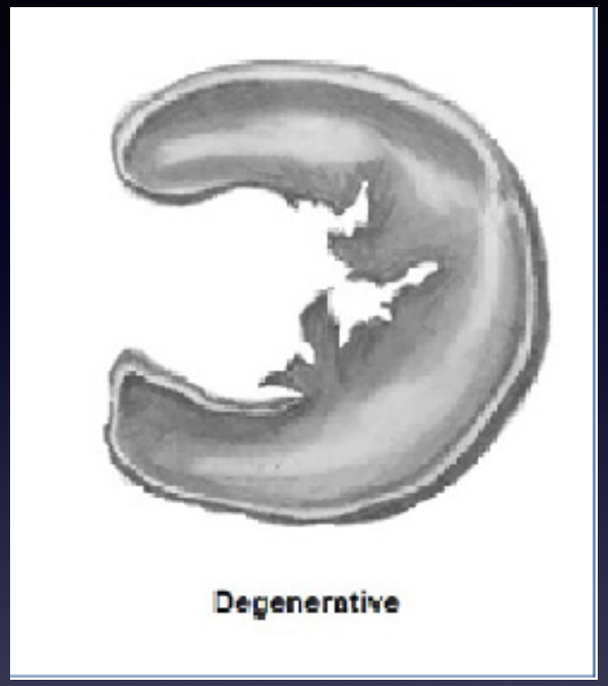
Blood Supply of Meniscus



Meniscal Tear Pattern

Radial

Parrot-Beak



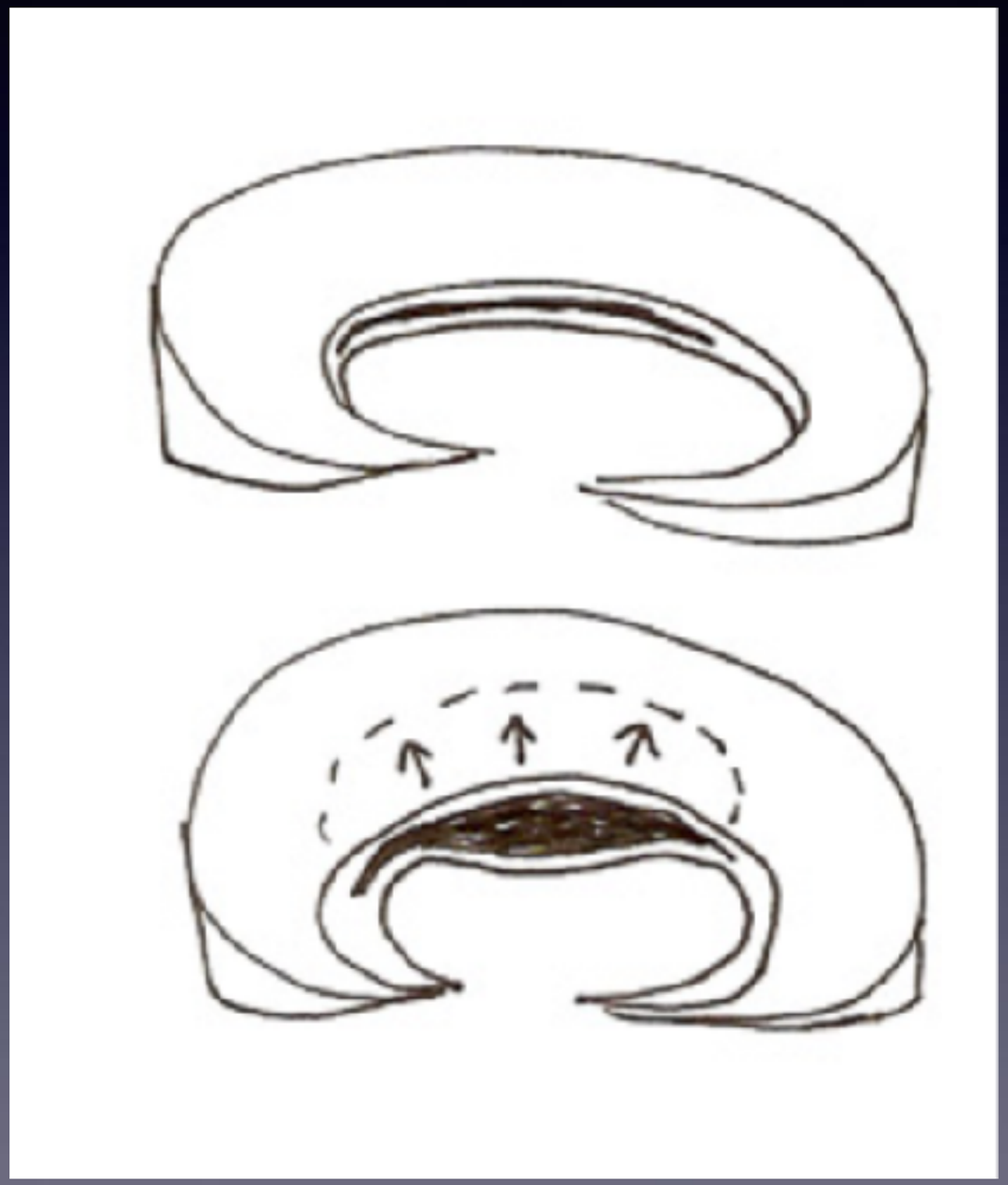
Degenerative

Vertical

Bucket-Handle

Flap

Horizontal Cleavage Tear



Traditional Treatment

- Partial Menisectomy
    - Degenerate mensical tear
    - Radial, parrot beak, complex, flap tears, horizontal cleavage
        - Avascular zone
- Repair
    - Young (under 35 yrs), traumatic acute vertical tears
    - Peripheral 1/3rd of the meniscus


6

Do Meniscal Repairs Have Superior Results to Partial Menisectomies?

The American Journal of Sports Medicine

Long-Term Outcome After Arthroscopic Meniscal Repair Versus Arthroscopic Partial Meniscectomy for Traumatic Meniscal Tears

Vol. 38, No. 8, 2010

Thomas Stein,*† MD, Andreas Peter Mehling,† MD, Frederic Welsch,† MD, Rüdige von Eisenhart-Rothe,‡ PhD, MD, and Alwin Jäger,†† MD

Long-Term Outcome After Arthroscopic Meniscal Repair Versus Arthroscopic Partial Meniscectomy for Traumatic Meniscal Tears

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Thomas Stein,[*†] MD, Andreas Peter Mehling,[†] MD, Frederic Welsch,[†] MD, Rüdige von Eisenhart-Rothe,[‡] PhD, MD, and Alwin Jäger,[††] MD

- 32 +/- 10yrs of age
- History of trauma
- Xrays and examination at mid-term and long term follow-up

The American Journal of Sports Medicine

Long-Term Outcome After Arthroscopic Meniscal Repair Versus Arthroscopic Partial Meniscectomy for Traumatic Meniscal Tears

Vol. 38, No. 8, 2010

Thomas Stein,*† MD, Andreas Peter Mehling,† MD, Frederic Welsch,† MD, Rüdige von Eisenhart-Rothe,‡ PhD, MD, and Alwin Jäger,†† MD

Fairbank Grade of Osteoarthritis	Long-Term (8.83 ± 2.62 y) $P = .005$		
	Grade 0	Grade 1	Grade 2
Repair	80.79%	19.23%	0%
Partial resection	40.00%	60.00%	0%

Long-Term Results		Preinjury Tegner Sports Activity Score	Follow-up Tegner Sports Activity Score	Tegner Sports Activity Score Change
Repair (n = 26)	Mean	5.50	5.46	0.04
Partial resection (n = 20)	Mean	6.25	5.30	0.95

Osteoarthritis and Cartilage

OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

The risk of symptomatic knee osteoarthritis after arthroscopic meniscus repair vs partial meniscectomy vs the general population

F. Persson † ✉, A. Turkiewicz ‡ ✉, D. Bergkvist ‡ ✉, P. Neuman † ✉, M. Englund ‡§ ✉

Volume 26, Issue 2, February 2018, Pages 195-201

- 2487 patients 16-45yrs old with meniscal surgery between 1998-2010 (F/U 5-18yrs)
- Symptomatic OA in:
    - 2.3% general population
    - 10% after meniscal repair
    - 17% after arthroscopic partial menisectomy

Is Surgery Superior to Non-operative Treatment for **Degenerate** Meniscal Tears?

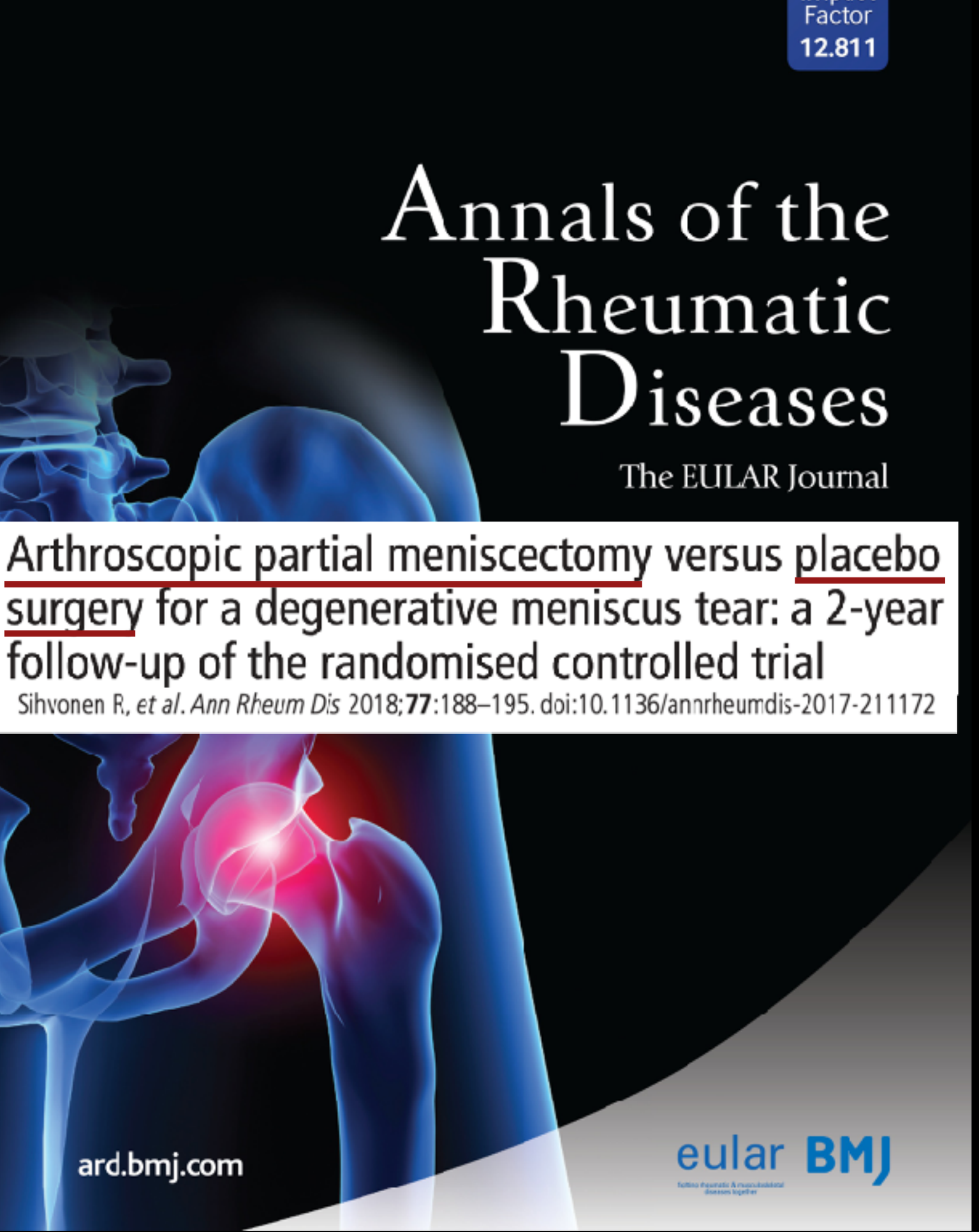
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MAY 2, 2013 VOL. 368 NO. 18

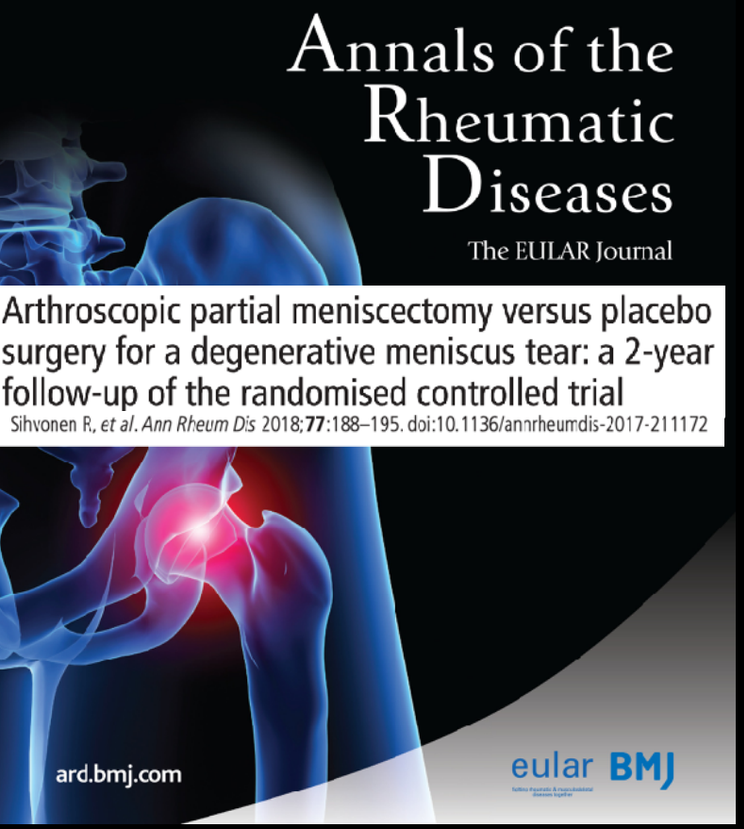
Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis

CONCLUSIONS

In the intention-to-treat analysis, we did not find significant differences between the study groups in functional improvement 6 months after randomization; however, 30% of the patients who were assigned to physical therapy alone underwent surgery within 6 months. (Funded by the National Institute of Arthritis and Musculoskeletal and Skin Diseases; METEOR ClinicalTrials.gov number, NCT00597012.)



- Age 35-65 yrs
- No arthritis
- Degenerate meniscal tear with symptoms



No difference in outcome for any tear type or pre-operative symptom

Table 3 Secondary outcomes of the trial at 24-month follow-up. Values are numbers (percentage)

Outcome	APM (n=70)	Placebo surgery (n=74)	P Value
Satisfied patients	54 (77.1)	58 (78.4)	1.000
Improved patients	61 (87.1)	63 (85.1)	0.812
Treatment-group unblinding	5 (7.1)	7 (9.2)	0.767
Reoperations	4 (5.7)	7 (9.2)	0.537
Arthroscopy	2 (2.9)	6 (7.9)	0.279
HTO/TKR	2 (2.9)	1 (1.3)	0.607
Returned to normal activities	50 (72.5)	58 (78.4)	0.442
Serious adverse events	1 (1.4)	0	0.479
Mechanical symptoms	18 (25.7)	15 (20.3)	0.552
Meniscal tests			
Positive McMurray test	6 (8.6)	5 (6.8)	0.760
Pain provoked by forced flexion and compression	8 (11.4)	10 (13.5)	0.803
Pain provoked by palpation at the joint line	22 (31.4)	21 (28.8)	0.855
At least one positive meniscal test	26 (37.1)	25 (33.8)	0.729

thebmj

BMJ 2017 ; 357 doi: https://doi.org/10.1136/bmj.j1982 (Published 10 May 2017)

RAPID RECOMMENDATIONS

Arthroscopic surgery for degenerative knee arthritis and meniscal tears: a clinical practice guideline

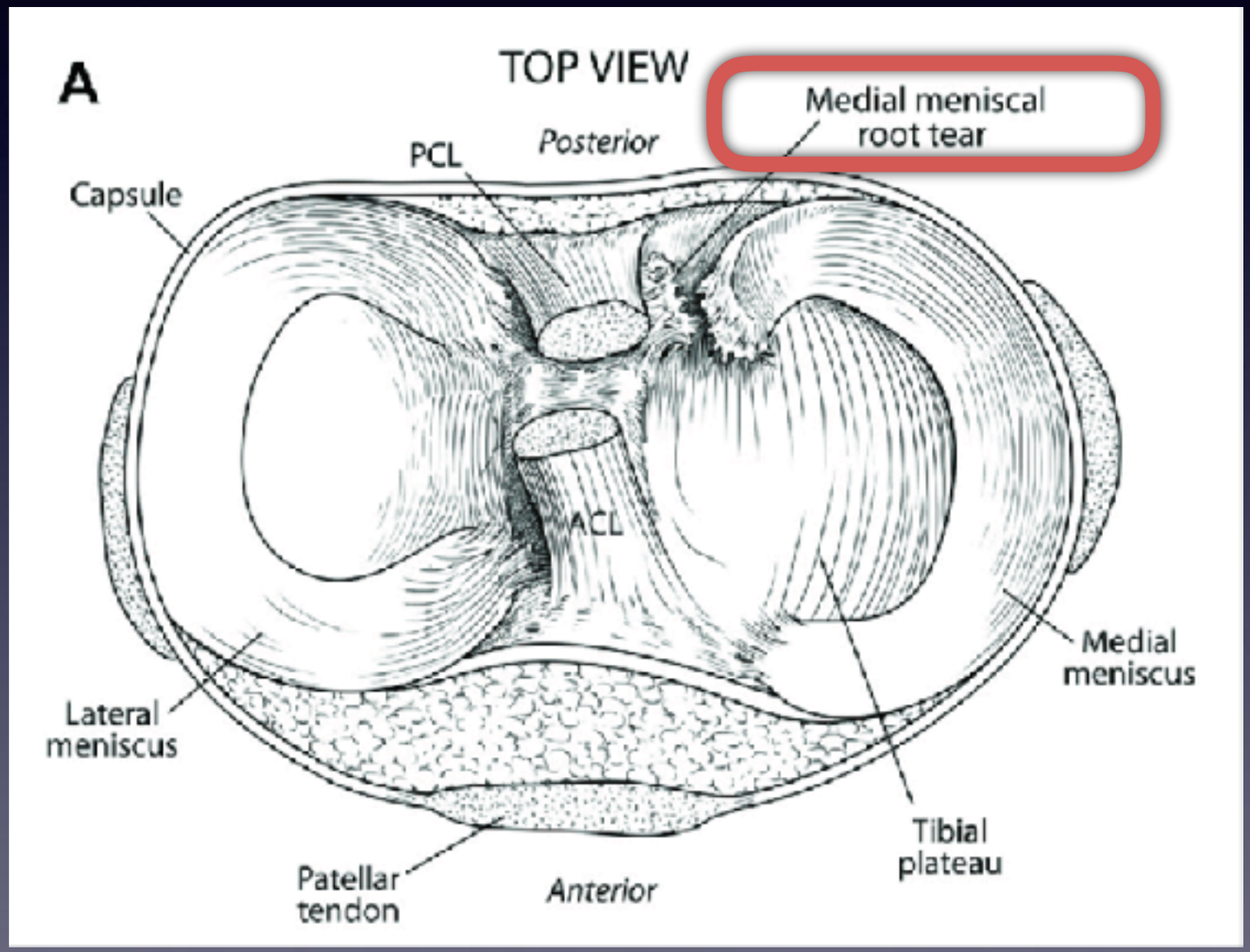
We make a strong recommendation against the use of arthroscopy in nearly all patients with degenerative knee disease, based on linked systematic reviews; further research is unlikely to alter this recommendation

What is New?

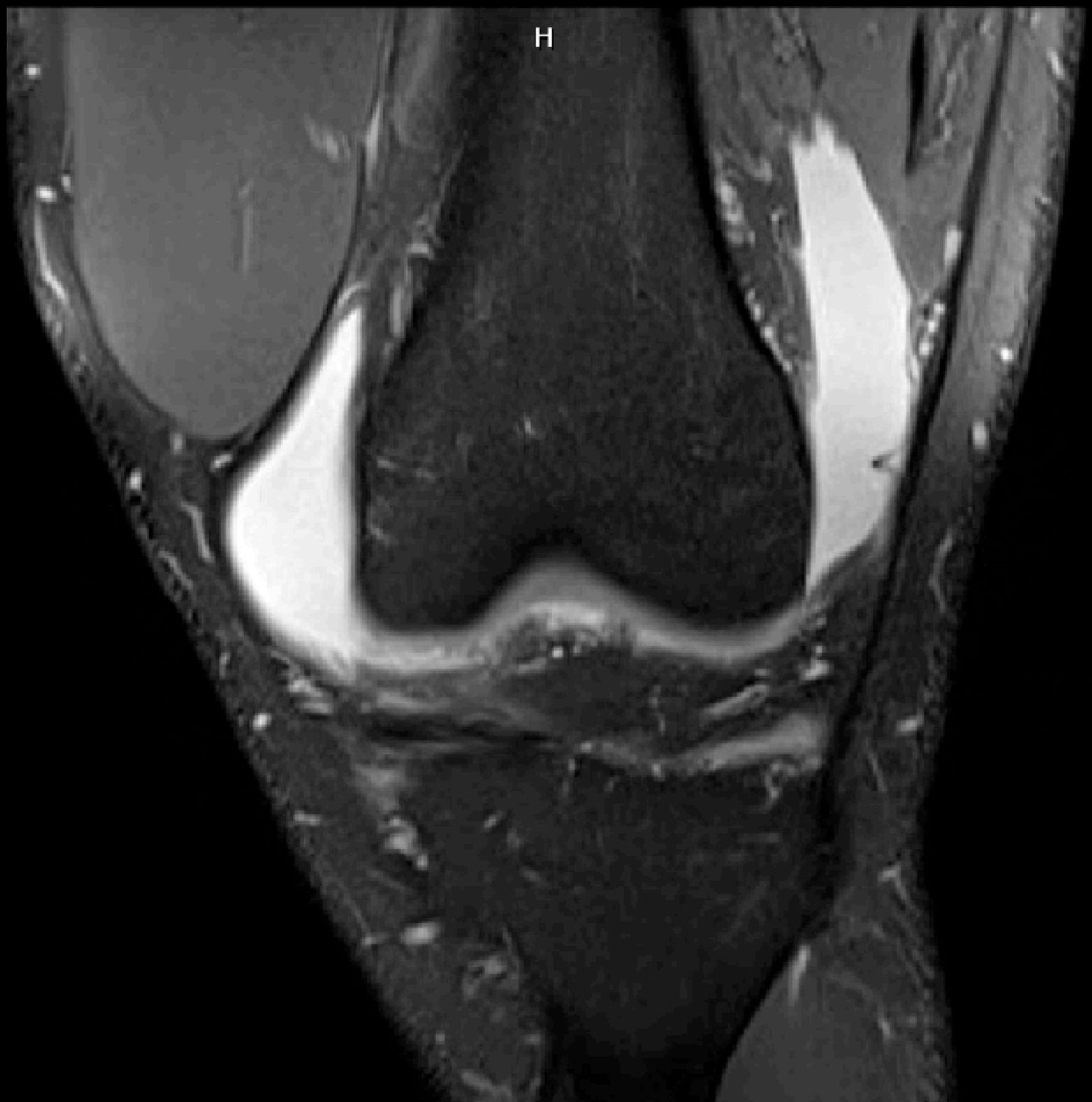
- Recently Recognised Meniscal Tear Patterns
  - Meniscal Ramp Tear
  - Meniscal Root Tear
- Repairable Meniscus

Meniscal Root Tear

- Meniscal Root - attachment of meniscus to tibia
- Loss of the attachment de-functions the whole meniscus
- Meniscus extrudes from the joint
- Both degenerate and traumatic
- Only recently have they been picked up on MRI consistently



MRI Scan



Meniscal Root Repair

- Previously treated with resection
- First repair techniques only reported in 2005

Technique

Technique

Technique

Technique

Meniscal Root Tear Repair

12TH Biennial
ISAKOS CONGRESS 2019
Cancun, Mexico • May 12–16, 2019

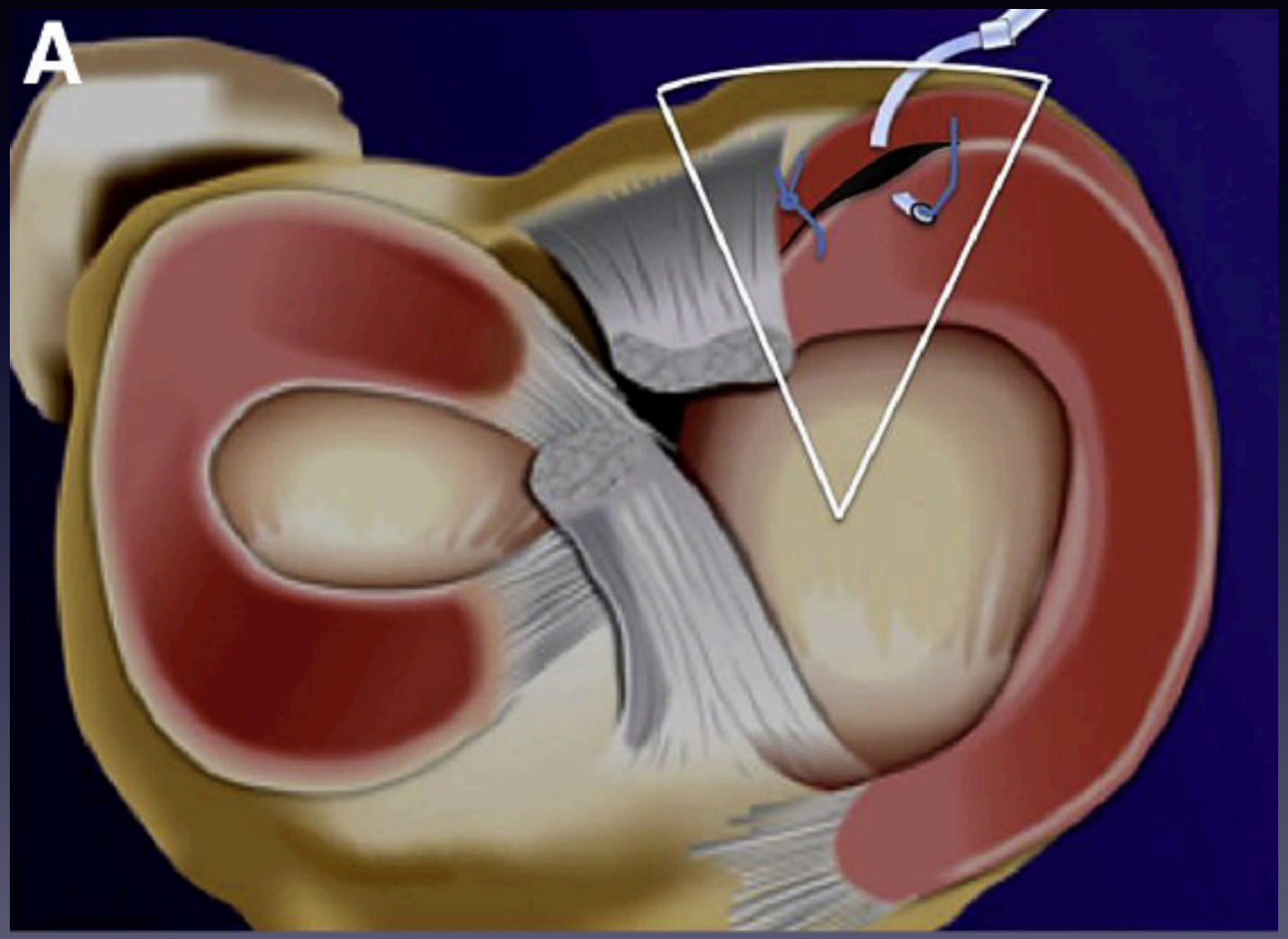
International Society of
Arthroscopy, Knee Surgery and
Orthopaedic Sports Medicine

Outcomes of Arthroscopic Repair vs. Observation in Older Patients with Meniscal Root Tears

Jason L. Dragoo, MD, Redwood City, CA UNITED STATES

- 48 patients with minimum 2 yrs follow-up
- Arthroscopic repair better pain and function
- 3.3% arthroscopic repair needed a TKA vs 33.3% of the observation group

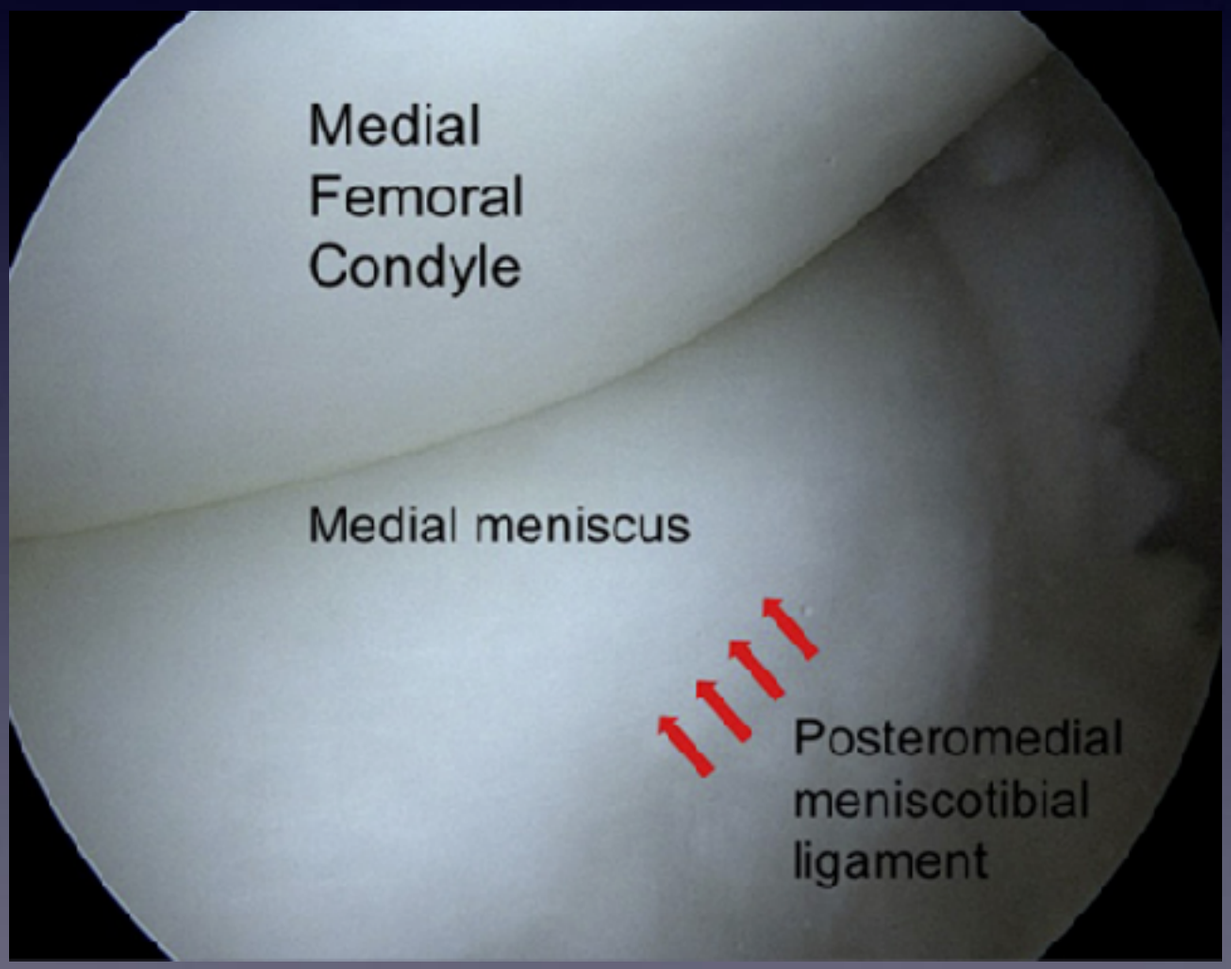
Mensical Ramp Tear



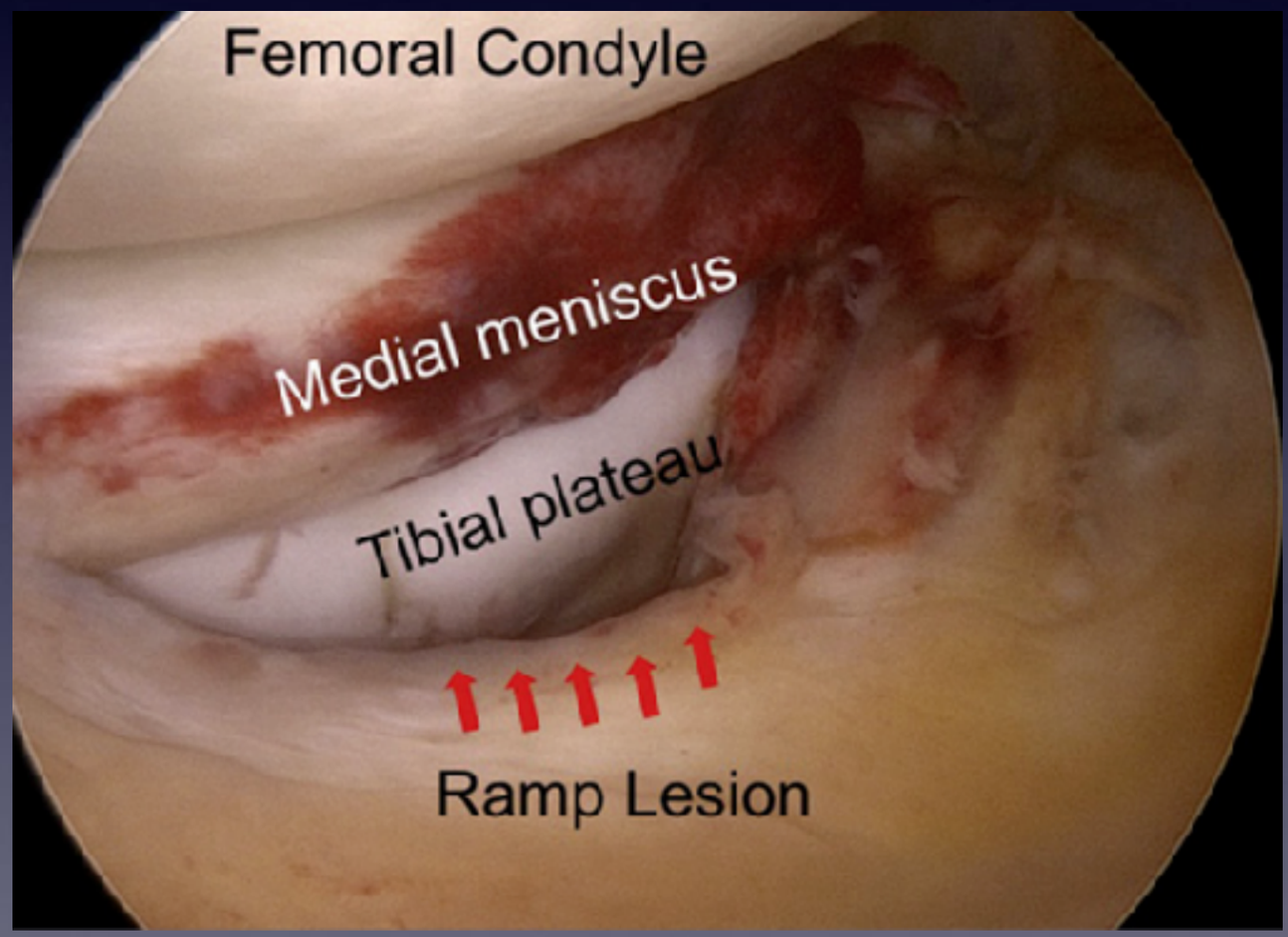
- Mensico-capsular junction tear
- 15% of ACL tears will have a MM ramp tear

Mensical Ramp Tear

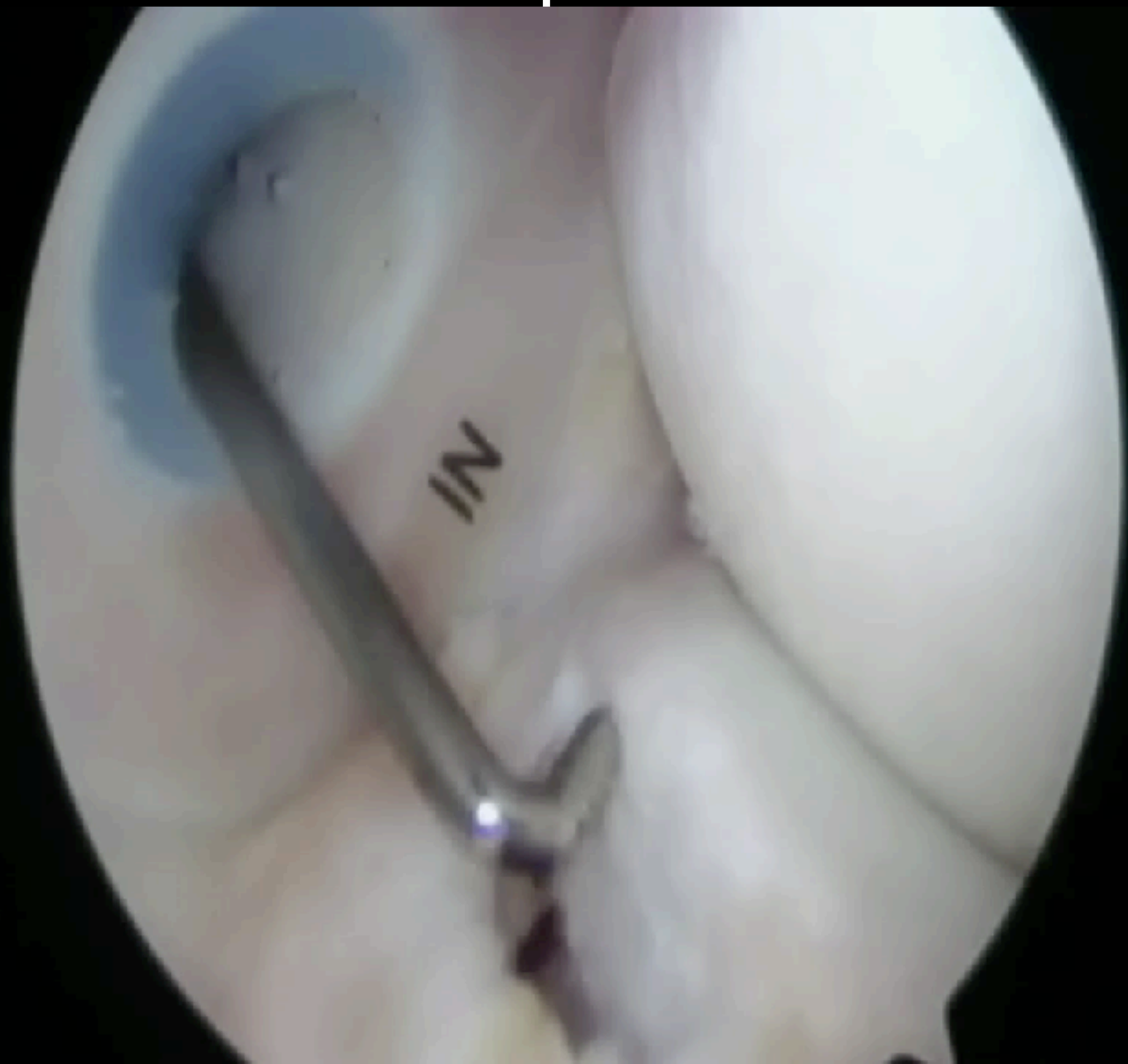
Normal



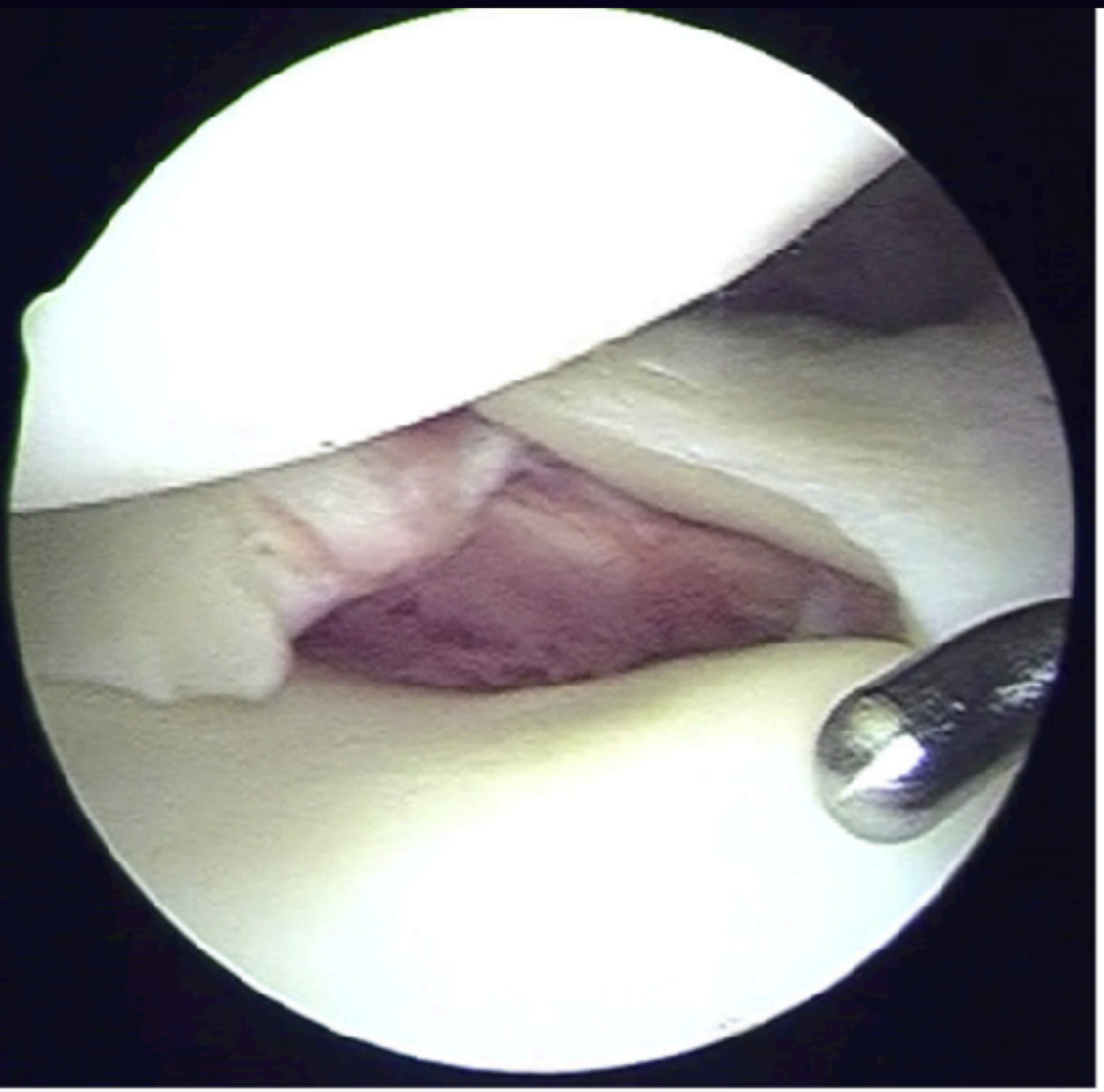
Meniscal Ramp Tear

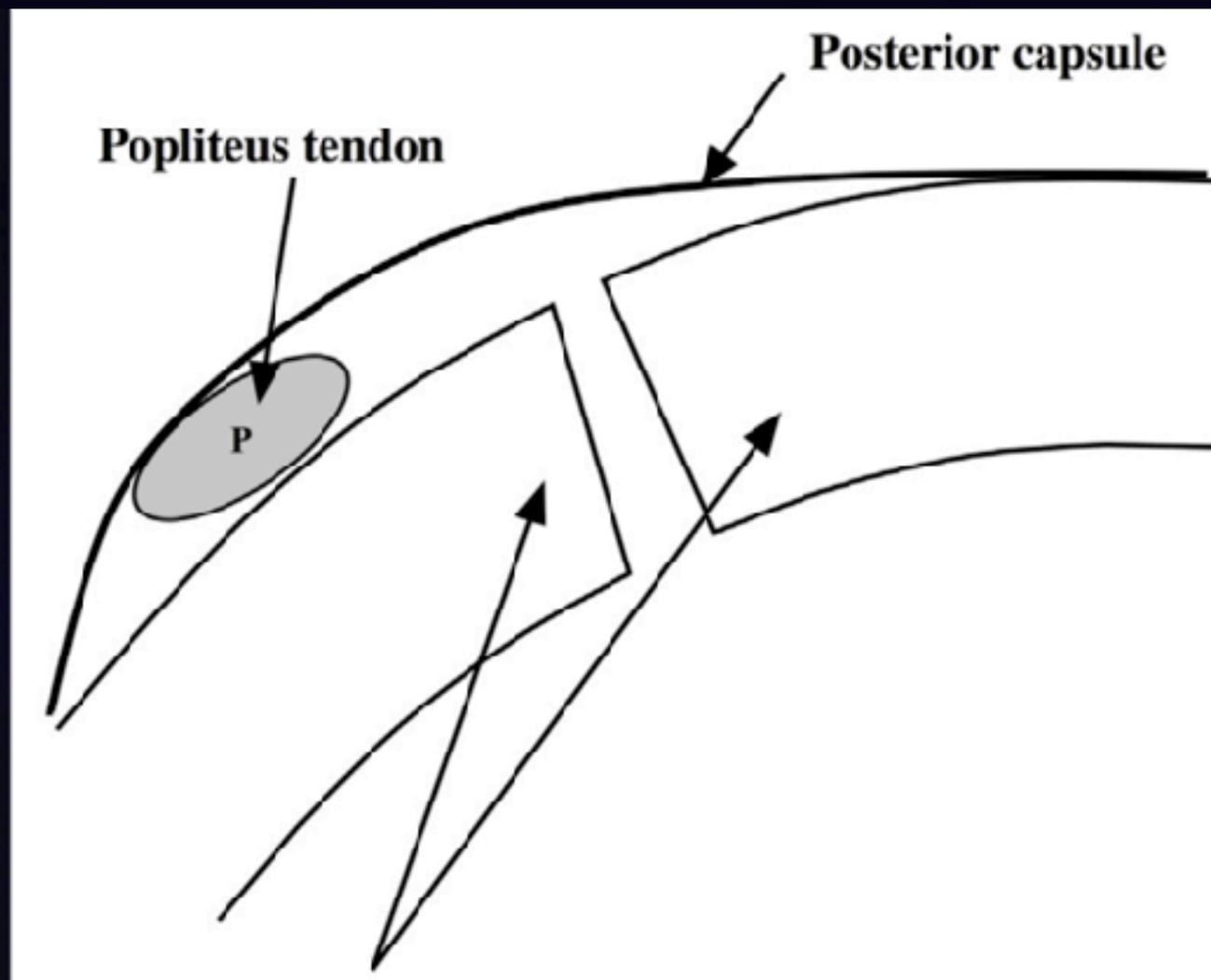


Meniscal Ramp Lesion Repair



Radial Tear of Lateral Meniscus





Stumps of the posterior lateral meniscal tear

Radial Tears of Lateral Meniscus Repair

Journal of Orthopaedic Science 23 (2018) 122–126

Contents lists available at ScienceDirect

Journal of Orthopaedic Science

journal homepage: http://www.elsevier.com/locate/jos

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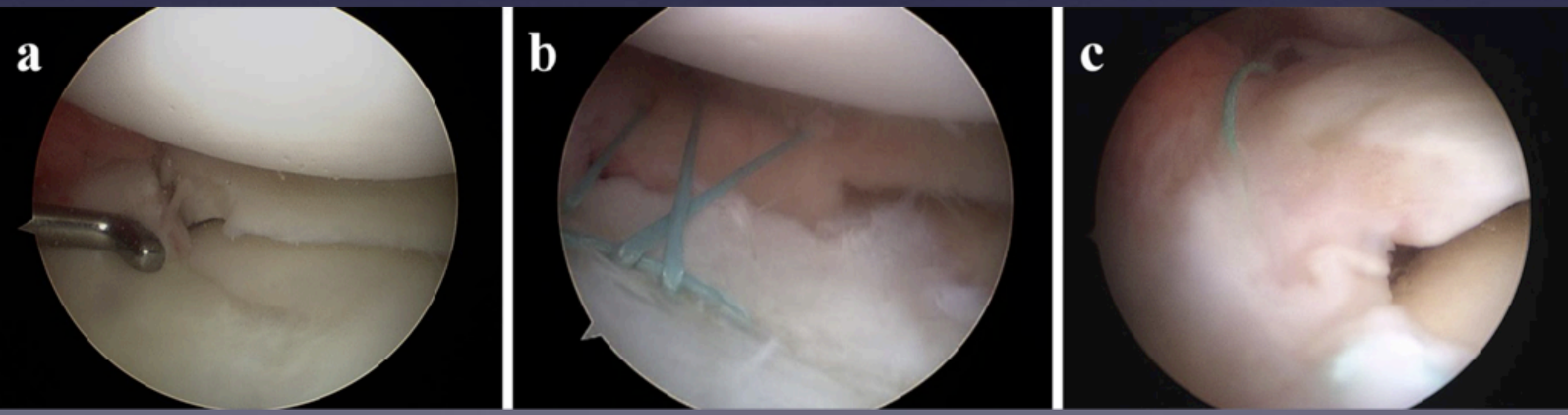
Second look arthroscopic evaluation of repaired radial/oblique tears of the midbody of the lateral meniscus in stable knees

Akira Tsujii [a, *], Hiroshi Amano [b], Yoshinari Tanaka [b], Keisuke Kita [b], Ryohei Uchida [c], Yoshiki Shiozaki [c], Shuji Horibe [d]



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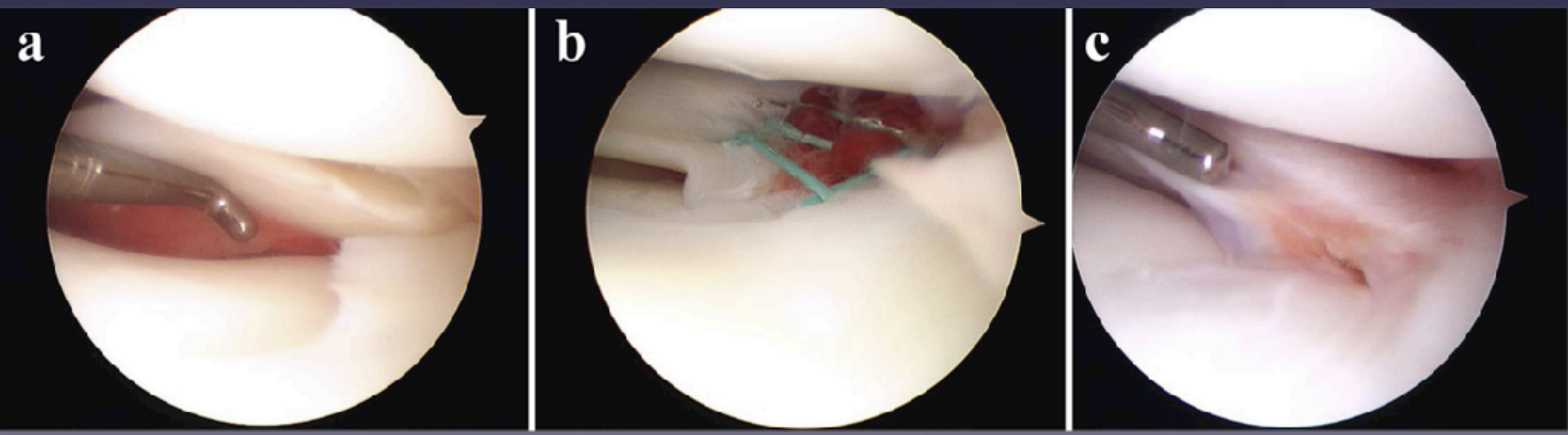

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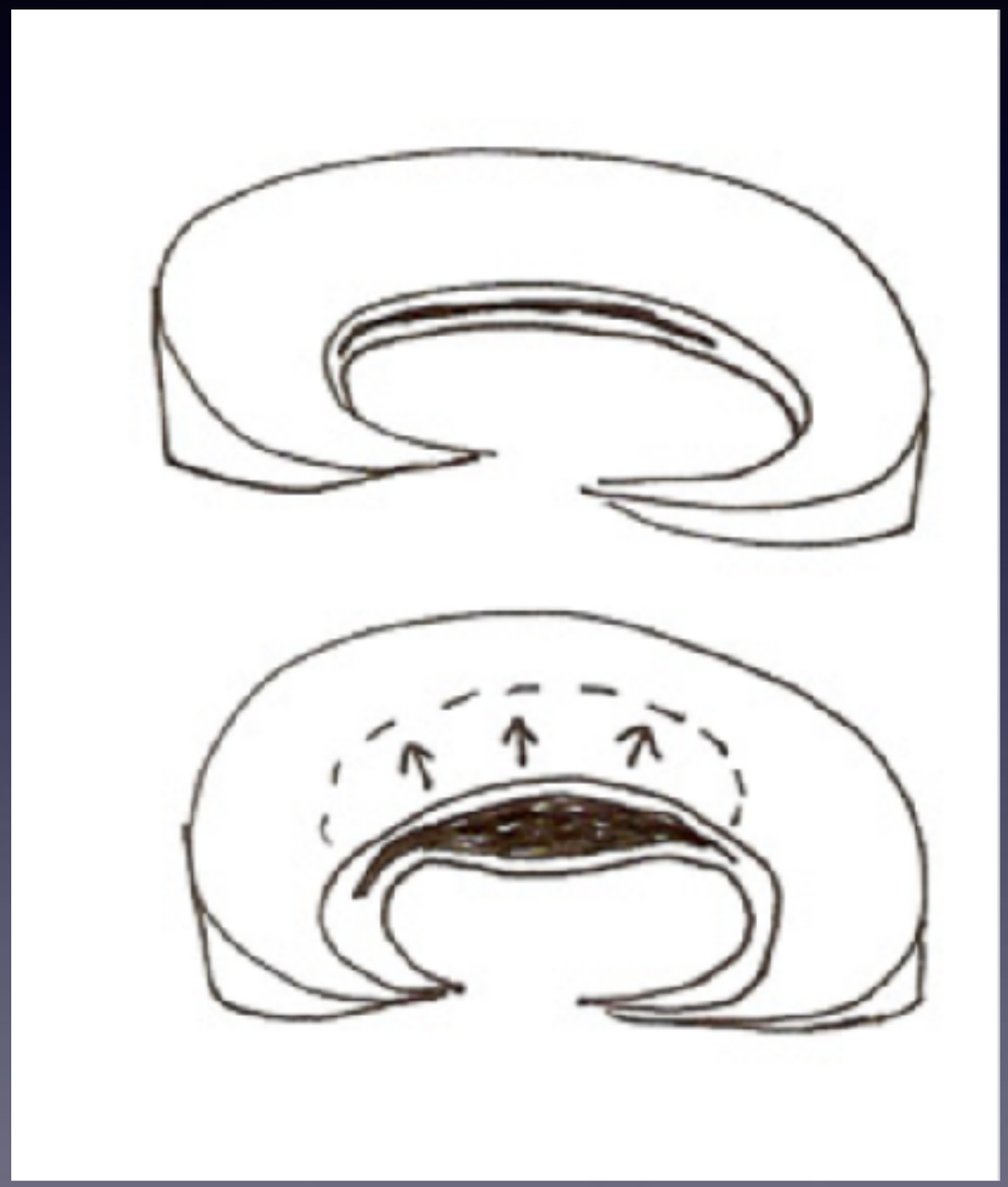
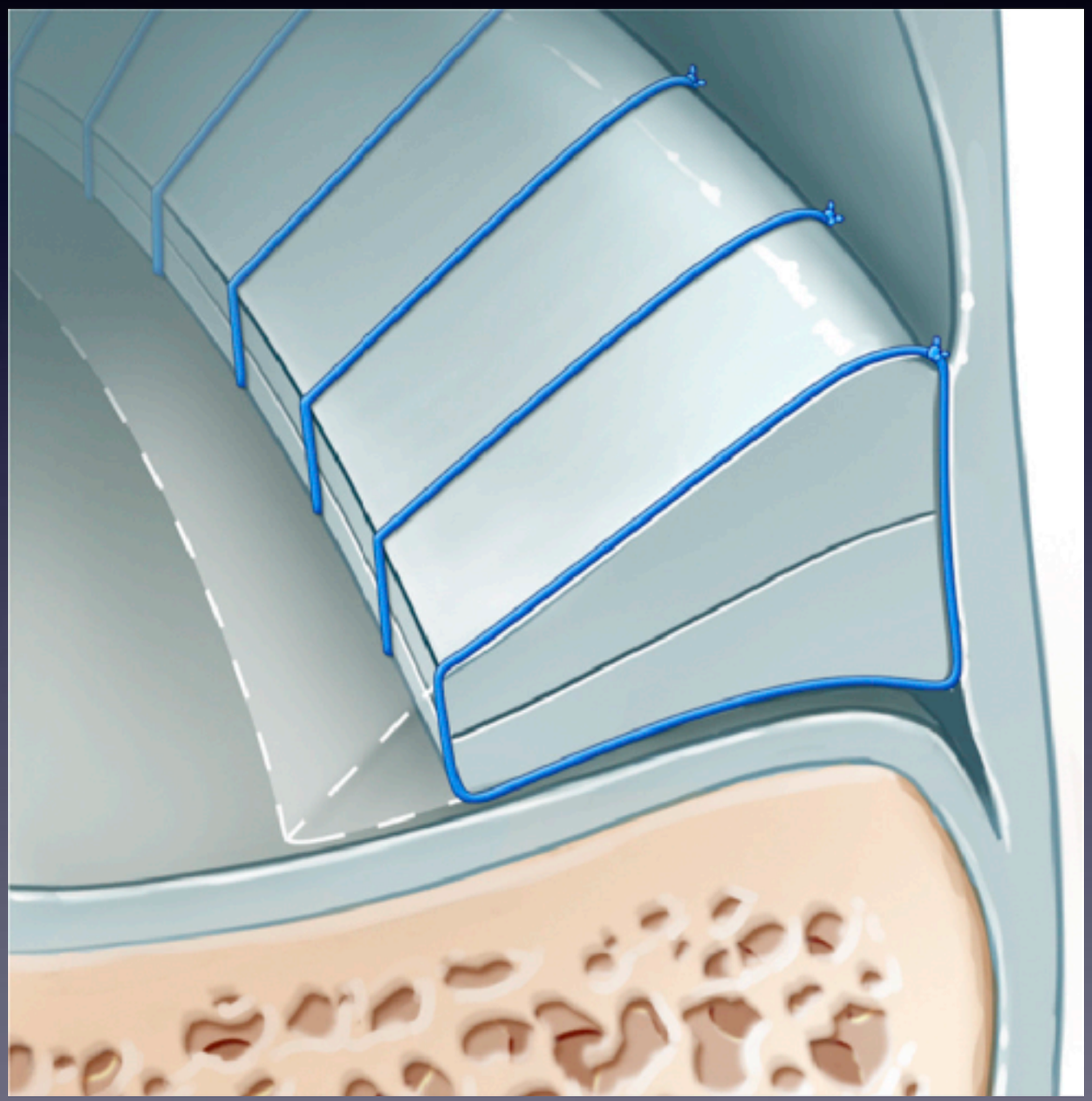
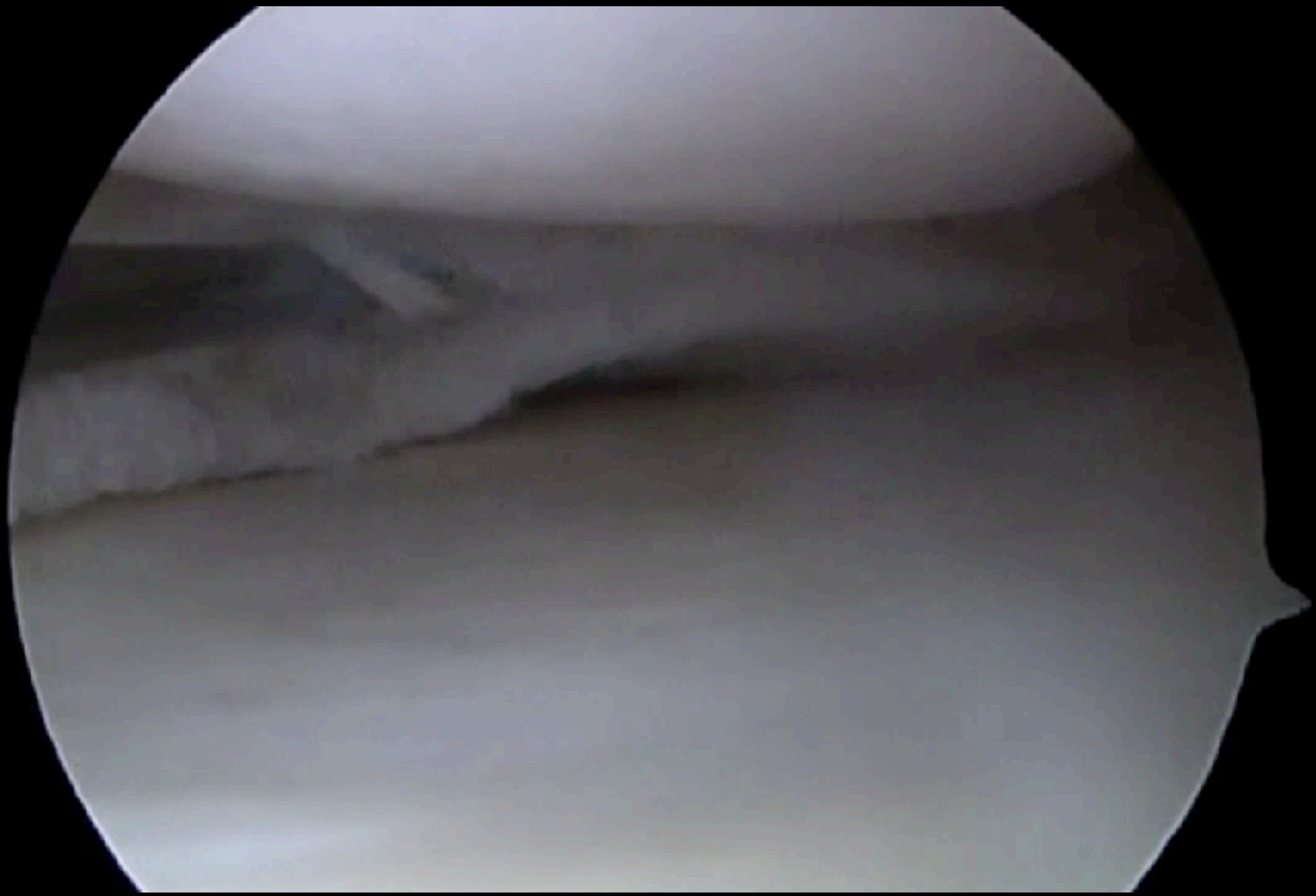
- No patients had symptoms at 6 months
- All patients had second look arthroscopy
  - Complete healing in 22%
  - Partial healing in 39%
  - Failure to heal in 39%
- Full thickness radial tears did best

Horizontal Cleavage Tear





Horizontal Cleavage Tear Repair



Systematic Review

Repair of Horizontal Meniscus Tears: A Systematic Review

Peter R. Kurzweil, M.D., Nancy M. Lynch, M.D., Sheldon Coleman, M.D., and Brian Kearney, Ph.D.

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 30, No 11 (November), 2014: pp 1513-1519

- Overall success 77.8%

- Conclusion - results of a repair for a horizontal cleavage tear is comparable to repairs of other types of meniscal tears

What I Do

- Degenerate Complex Tear (non-repairable pattern)
  - Non-operative for 6 months
    - If persistent or worsening pain repeat MRI
    - Only consider surgery if failed above and patient understands that arthroscopy will not improve long term outcome.
    - Arthroscopic partial meniscectomy

What I Do

- Repair symptomatic:
  - Vertical peripheral meniscal tears
  - Meniscal root tears (without severe OA)
  - Complete lateral meniscal radial tears
  - Ramp lesions (more than 1.5cm)
  - Horizontal cleavage tears

Summary

- Advancements in surgical techniques have expanded the indications for repairs, to include patterns previously considered irreparable.
- Meniscal repairs are superior to non-operative and meniscal resection for pain, function and development of degenerate changes
- Degenerate meniscal tears can usually be treated non-operatively. Most patient symptoms will improve after 3-6 months of non-operative treatment
- Arthroscopic partial meniscectomy does not improve short or long term outcomes of knee

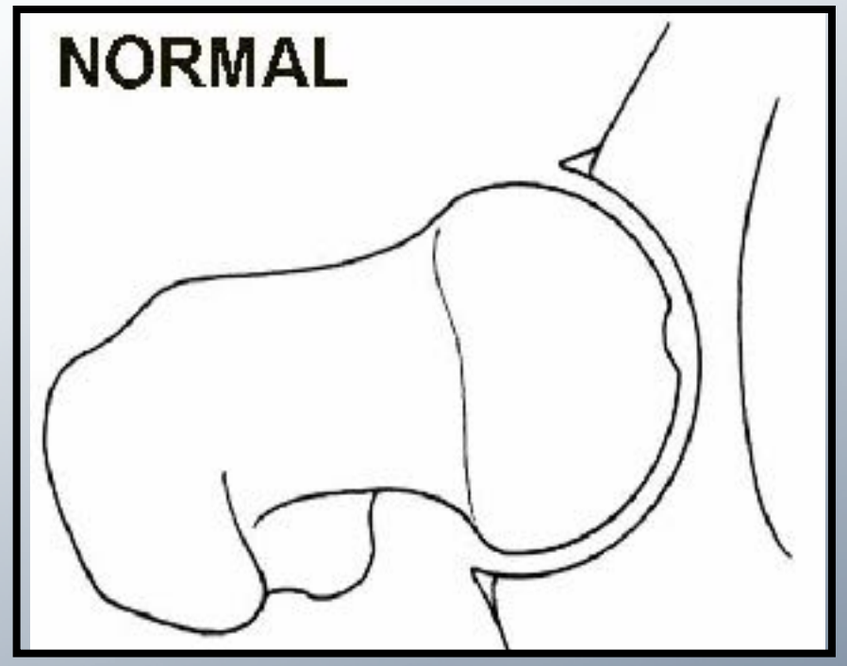
Acetabular Labral Tears and FAI

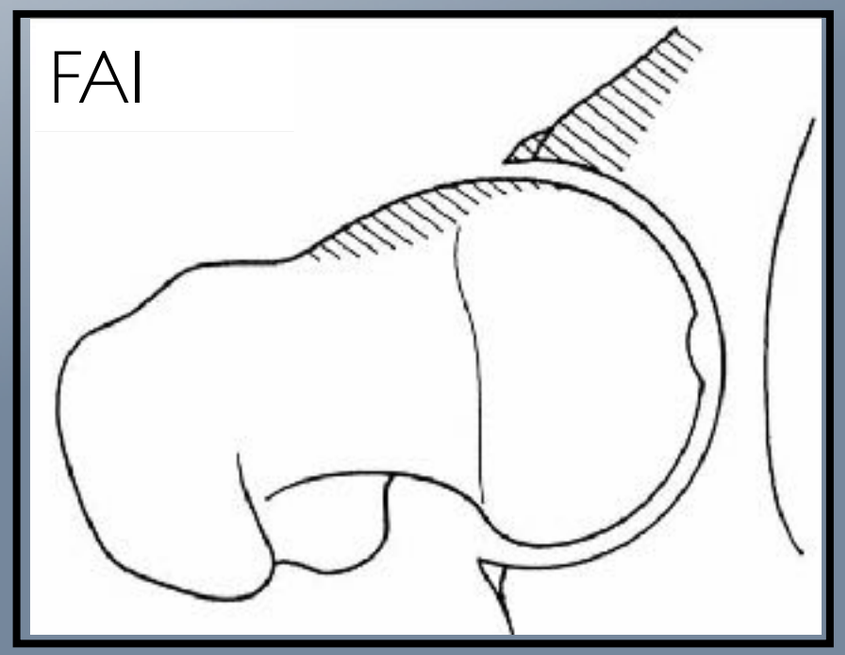
The Basics, The Controversies and What's New

Femoroacteabular Impingement (FAI)

- Abnormal bony morphology of
  - femoral head
  - femoral neck
  - acetabulum

- Prevents free symmetrical movement between "ball and socket" of hip





Cam FAI

Pincer FAI

Labral Tear and FAI – Symptoms

- Groin pain is most common complaint
  - Anterior groin: 92%
  - Anterior thigh 52%
  - Lateral hip: 59:%
  - Deep within the buttocks: 38%
  - No Patients with isolated buttock pain

Burnett S, Della Rocca G, Prather H, et al
Clinical presentation of patients with tears of the acetabular labrum.
J Bone Joint Surg Am. 2006;88(7):1448–57

The Controversies

- Aetiology of FAI
- How common is FAI?
- Does FAI really lead to hip pain and OA?
- Non-operative vs Operative Treatment of Labral Tear and FAI
- Is Prophylactic Surgery necessary?
- Role of Labral Reconstructions

Aetiology of FAI

- Cam deformities are a result of structural adaption to the high impact sporting activities during growth, when the skeleton is highly sensitive to mechanical loading

- Pincer
  - Global pincers (protrusio/coxa profunda) in some are due to metabolic or inflammatory processes. Most have no disease

  - Focal pincer - unknown (genetics?)

HIP International

EUROPEAN HIP SOCIETY

Prevalence of femoroacetabular impingement and effect of training frequency on aetiology in paediatric football players

| June 22, 2018

- 214 Soccer players
- 10-12yrs 0% FAI, 13-15yrs 19.1% FAI, 16-17 yrs 60% FAI.
- Training 12.5 hrs per week doubled the risk of FAI morphology

Are Labral Tears All Symptomatic?

Prevalence of Abnormal Hip Findings in Asymptomatic Participants

A Prospective, Blinded Study

Brad Register,* MD, Andrew T. Pennock,† MD, Charles P. Ho,‡ PhD, MD, Colin D. Strickland,§ MD, Ashur Lawand,‖ MD, and Marc J. Philippon,‡¶ MD
Investigation performed at the Steadman Philippon Research Institute, Vail, Colorado

- 45 asymptomatic patient aged 15-66 (average 37yrs)
- 3 radiologists with MS Training with 2/3 for positive result
- Mixed in 19 symptomatic patient scan (blinding)

Conclusion: Magnetic resonance images of asymptomatic participants revealed abnormalities in 73% of hips, with labral tears being identified in 69% of the joints. A strong correlation was seen between participant age and early markers of cartilage degeneration such as cartilage defects and subchondral cysts.

Orthopaedic Journal of Sports Medicine
http://ojs.sagepub.com/

Hip Labral Tears among Asymptomatic Professional Hockey Players Identified on MRI: Four-year Follow-up Study

Robert A. Gallo, Matthew Silvis, Brandon Smetana, Timothy Mosher, Dan Stuck, Scott A. Lynch and Kevin P. Black

Orthopaedic Journal of Sports Medicine 2013 1:

- 21 asymptomatic hockey players had MRI hips
- 15/21 (71%) had labral tears
- At 1 yr 2/21 developed hip pain (both with labral tears)
- At 2 yrs 4/21 hip symptoms (only one missed games because of it)
- Conclusion – only 20% of labral tear in hockey players develop symptoms within 2 years and only 7% missed games within 4 years due to hip-related pain

How common is FAI?

Does FAI Result in Hip pain and Arthritis?

Spectrum of Radiographic Femoroacetabular Impingement Morphology in Adolescents and Young Adults: An EOS-Based Double-Cohort Study

Matthew R. Schmitz, MD, Bernd Bittersohl, MD, Daniela Zaps, MD, James D. Bomar, MPH, Andrew T. Pennock, MD, and Harish S. Hosalkar, MD

Investigation performed at Rady Children's Hospital, San Diego, California

- 180 hips
- Pincer
  - 93% had 1 sign
  - 52% 2 signs
- Cam
  - 6%

In-Depth

Incidence of Hip Pain in a Prospective Cohort of Asymptomatic Volunteers

Is the Cam Deformity a Risk Factor for Hip Pain?

Vickas Khanna,* MD, FRCSC, Anthony Caragianis,* BSc, Gina DiPrimio,† MD, FRCPC, Kawan Rakhra,† MD, FRCPC, and Paul E. Beaulé,*‡ MD, FRCSC
Investigation performed at The Ottawa Hospital, University of Ottawa, Ottawa, Ontario, Canada

- 170 volunteers (340 hips) mean age 29
- 14% had cam deformity
- 4-5yrs F/U
- 6.5% reported hip pain more than 6 week
- 4.3 RR of developing hip pain with cam defomity
- 3.1 RR of developing hip pain with <20 IR

Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 29, No 3 (March), 2013: pp 405-410

Osteoarthritis and Cartilage
Volume 21, Issue 10 , Pages 1514-1521, October 2013

Pincer deformity does not lead to osteoarthritis of the hip whereas acetabular dysplasia does: acetabular coverage and development of osteoarthritis in a nationwide prospective cohort study (CHECK)

Results

At baseline, 76% of the included hips had no signs of radiographic OA (K&L = 0) whereas 24% had doubtful OA (K&L = 1). Within 5 years, 7.0% developed incident OA. Acetabular dysplasia was significantly associated with development of incident OA with ORs between 2.62 (95% confidence interval (CI) 1.44–4.77) and 5.45 (95% CI 2.40–12.34), dependent on the radiographic view. A pincer deformity was not associated with any outcome measure, except for a significantly protective effect on incident OA when a pincer deformity was present in both radiographic views OR 0.34 (95% CI 0.13–0.87).

Conclusion

Acetabular dysplasia was significantly associated with development of OA. However, a pincer deformity was not associated with OA, and might even have a protective effect on its development, which questions the supposed detrimental effect of pincer impingement.

Prevalence of Malformations of the Hip Joint and Their Relationship to Sex, Groin Pain, and Risk of Osteoarthritis

A Population-Based Survey

By Kasper Kjaergaard Gosvig, MD, Steffen Jacobsen, MD, PhD, Stig Sonne-Holm, MD, PhD, Henrik Palm, MD, and Anders Troelsen, MD, PhD

Conclusions: In our study population, a deep acetabular socket and a distal grip deformity were common radiographic findings and were associated with an increased risk of hip osteoarthritis. The high prevalence of osteoarthritis in association with malformations of the hip joint suggests that an increased focus on early identification of malformations should be considered.

- Conclusions
  - Cam lesions, protrusio and DDH predispose to early onset of OA
  - Pincer lesions do not
  - 80% of patient with FAI will remain free of OA for 20yrs

An examination of the association between different morphotypes of femoroacetabular impingement in asymptomatic subjects and the development of osteoarthritis of the hip

G. Hartofilakidis, MD, FACS, Emeritus Professor of Orthopaedics[1]; N. V. Bardakos, MD, Locum Consultant Orthopaedic Surgeon[2]; G. C. Babis, MD, DSc, Associate Professor[3]; and G. Georgiades, MD, Orthopaedic Surgeon[4]

J Bone Joint Surg Br **May 2011** vol. 93-B no. 5 **580-586**

We retrospectively examined the long-term outcome of 96 asymptomatic hips in 96 patients with a mean age of 49.3 years (15 to 65) who had radiological evidence of femoroacetabular impingement. When surveillance commenced there were 17, 34, and 45 hips with cam, pincer, and mixed impingement, respectively. Overall, 79 hips (82.3%) remained free of osteoarthritis for a mean of 18.5 years (10 to 40). In contrast, 17 hips (17.7%) developed osteoarthritis at a mean of 12 years (2 to 26). No statistically significant difference was found in the rates of development of osteoarthritis among the three groups ($p = 0.43$). Regression analysis showed that only the presence of idiopathic osteoarthritis of the contralateral diseased hip was predictive of development of osteoarthritis on the asymptomatic side ($p = 0.039$).

We conclude that a substantial proportion of hips with femoroacetabular impingement may not develop osteoarthritis in the long-term. Accordingly, in the absence of symptoms, prophylactic surgical treatment is not warranted.

Is non-operative treatment effective?

Is operative treatment superior to non-operative?

Hip arthroscopy versus best conservative care for the treatment of femoroacetabular impingement syndrome (UK FASHIoN): a multicentre randomised controlled trial

Lancet
Vol 391 June 2, 2018

Damian R Griffin, Edward J Dickenson, Peter D H Wall, Felix Achana, Jenny L Donovan, James Griffin, Rachel Hobson, Charles E Hutchinson, Marcus Jepson, Nick R Parsons, Stavros Petrou, Alba Realpe, Joanna Smith, Nadine E Foster, on behalf of the UK FASHIoN Study Group*

- 348 patients with symptomatic FAI deemed suitable for hip arthroscopy
- Randomised to Surgery or Conservative Care
- 12 month follow up
- iHOT-33 scoring (international Hip Outcome Tool):
    1. symptoms and functional limitations
    2. sports and recreational physical activities
    3. job related concerns
    4. social, emotional and lifestyle concerns

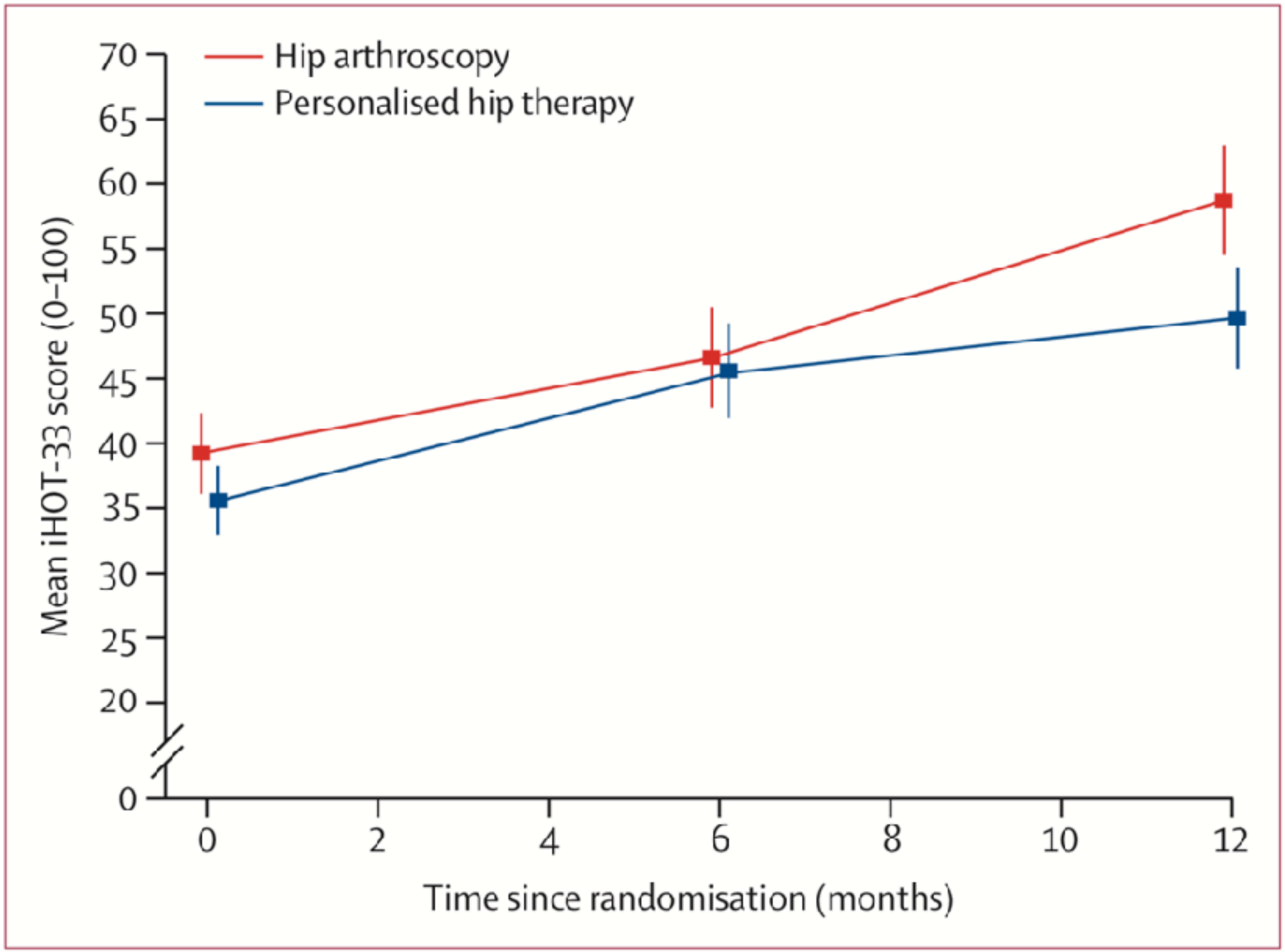


Figure 2: **Changes in mean iHOT-33 score from baseline to 6 and 12 months after randomisation**

Error bars are 95% CIs. iHOT-33=International Hip Outcome Tool.

Lancet
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Hip arthroscopy versus best conservative care for the treatment of femoroacetabular impingement syndrome (UK FASHIoN): a multicentre randomised controlled trial

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Results

- One scope had a infected hip and needed conversion to THR within the 12 months
- Crossover to scope by 14/172 within 12 months
- Only cam impingement (75%) morphology are suggestive of an increased treatment effect with hip arthroscopy

Personalised Hip Therapy: development of a non-operative protocol to treat femoroacetabular impingement syndrome in the FASHIoN randomised controlled trial

Br J Sports Med 2016;**50**:1217–1223.

Peter DH Wall,[1] Edward J Dickenson,[1] David Robinson,[2] Ivor Hughes,[3] Alba Realpe,[1] Rachel Hobson,[1] Damian R Griffin,[4] Nadine E Foster[5]

- Believed to work by improving
  - muscle control and strength around the hip
  - movement patterns
  - avoidance of hip impingement

FOUR CORE COMPONENTS

1 Patient Education and advice

- Education about FAI and available treatments
- Advice about posture, gait and lifestyle behaviour modifications to try to avoid FAI.
- Advice about activities of daily living to try to avoid FAI (reducing / avoiding deep flexion, adduction and internal rotation of hip)
- Advice about relative rest. In particular, relative rest in a specific ROM where pain in that particular ROM is likely to represent ongoing impingement. Specific activity/sport technique advice and modification.

2 Patient Assessment

- History: to include: History of presenting complaint , relieving and aggravating factors, past Medical History, medications, previous treatments, social history including occupation, patients concerns, fears and beliefs, patients individual requirements and expectations.
- Examination Determine pain-free, passive ROM in the hip, determine the strength of motion in the hip in flexion, extension, abduction, adduction, internal and external rotation and impingement testing

3 Help with Pain Relief

- Advice about anti-inflammatory medication for 2 to 4 weeks.
- Advice about simple analgesics if they do not respond well to anti-inflammatory medication.
- Engagement in, and adherence to, a personalised exercise programme

4 Exercise-based hip programme

- An exercise programme that is individualised, progressive and supervised.
- A phased exercise programme that begins with muscle control work, and progresses to stretching and strengthening with increasing ROM and resistance.
- Muscle control / stability exercise (targeting pelvic and hip stabilisation, gluteal and abdominal muscles)
- Strengthening / resistance exercise firstly in available range (pain-free ROM), and targets: Gluteus maximus, short external rotators, gluteus medius, abdominal muscles, lower limb in general
- Stretching exercise to improve hip external rotation and abduction in extension and flexion (but not vigorous stretching – no painful hard end stretches). Other muscles to be targeted if relevant for the patient include iliopsoas, hip flexors and rotators.
- Exercise progression in terms of intensity and difficulty, gradually progressing to activity or sport-specific exercise where relevant.
- A personalised and written exercise prescription that is progressed and revised over treatment sessions.
- Encourage motivation and adherence through the use of a patient exercise diary to review progress.
- Patients to have access to therabands, exercise balls and exercise mats.

Personalised Hip Therapy: development of a non-operative protocol to treat femoroacetabular impingement syndrome in the FASHIoN randomised controlled trial *Br J Sports Med* 2016;**50**:1217–1223.

Peter DH Wall,[1] Edward J Dickenson,[1] David Robinson,[2] Ivor Hughes,[3] Alba Realpe,[1] Rachel Hobson,[1] Damian R Griffin,[4] Nadine E Foster[5]

Exercise Based Hip Programme

1. Muscle control/stability exercises (targeting pelvic and hip stabilisation, gluteal and abdominal muscles)

2. Strengthening/resistance exercise (in available pain-free ROM), targeting Glut. max and med, short ER's, abdominal and lower limb in general

3. Stretching (not painful hard end stretches) to improve ER, Abduction in extension and flexion. Also consider stretches to iliopsoas

4. Gradual progression of intensity and sport specific exercise when relevant

Who and When to Refer?

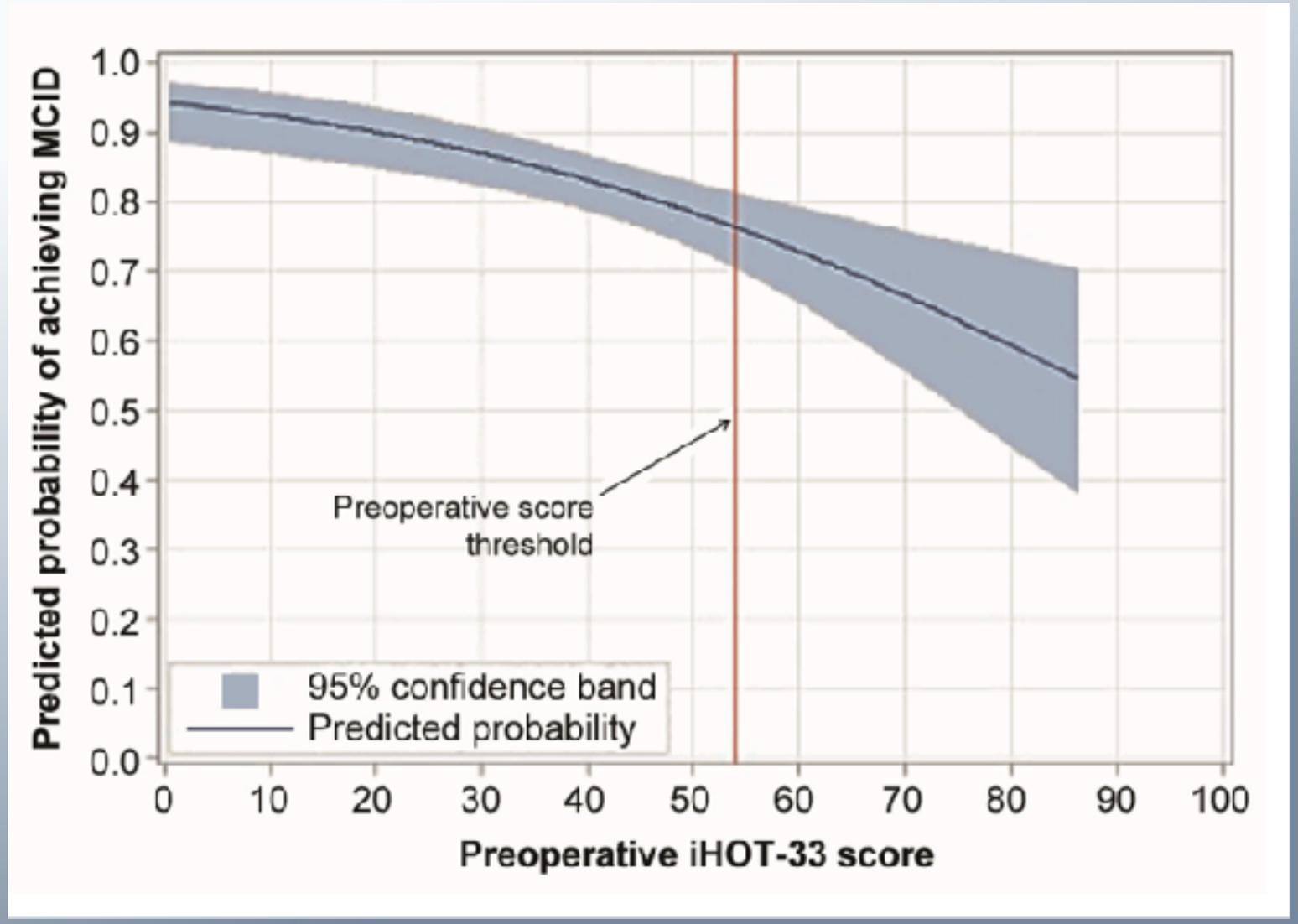
Who and When to Refer?

Significantly symptomatic FAI and labral tears who have not responded to 6-12 months on non-operative treatment

Preoperative Outcome Scores Are Predictive of Achieving the Minimal Clinically Important Difference After Arthroscopic Treatment of Femoroacetabular Impingement

AJSM Vol. 45, No. 3, 2017

Benedict U. Nwachukwu,*† MD, MBA, Kara Fields,† MS, Brenda Chang,† MS, MPH, Danyal H. Nawabi,† MD, Bryan T. Kelly,† MD, and Anil S. Ranawat,† MD
Investigation performed at the Hospital for Special Surgery, New York, New York, USA



Defining the "Substantial Clinical Benefit" After Arthroscopic Treatment of Femoroacetabular Impingement

The American Journal of Sports Medicine Vol. 45, No. 6, 2017

Benedict U. Nwachukwu,*† MD, MBA, Brenda Chang,† MS, MPH, Kara Fields,† MS, Brian J. Rebolledo,† MD, Danyal H. Nawabi,† MD, Bryan T. Kelly,† MD, and Anil S. Ranawat,† MD
Investigation performed at the Hospital for Special Surgery, New York, New York, USA

- SCB if:
  - Change in $iHOT_{33}$ by 24.5
  - Absolute $iHOT_{33}$ of 63.5

- Unlikely to get a SCB of pre-operative $iHOT_{33}$ is over 46

Is there a role of prophylactic surgery?

Is Prophylactic Surgery for Femoroacetabular Impingement Indicated?

CME

The American Journal of Sports Medicine,

Vol. 42, No. 12, 2014

A Systematic Review

Jason Andrew Collins,*† MD, James P. Ward,† MD, and Thomas Youm,† MD
Investigation performed at New York University Hospital for Joint Diseases, New York, New York

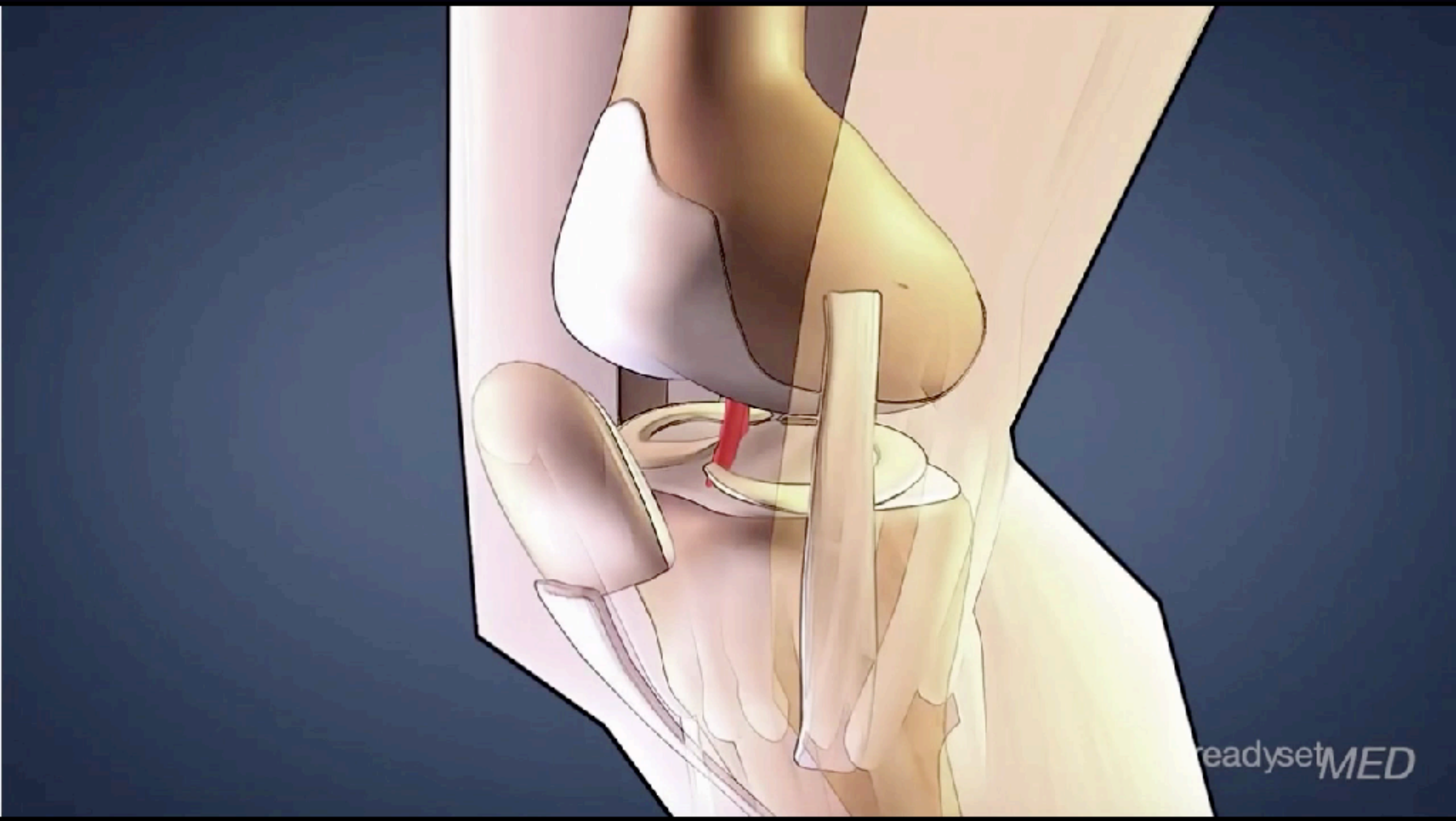
NO!

Summary

- FAI / Labral tears do not always cause symptoms
- Radiological/surgical findings do not predict symptoms
- Non-operative treatment for at least 6 months worth trialing
- Surgery is helpful, however, far from perfect
- No role for prophylactic surgery
- More research is necessary re
  - Operative vs non-operative in progression of OA
  - Operative vs non-op long term pain relief and return of function

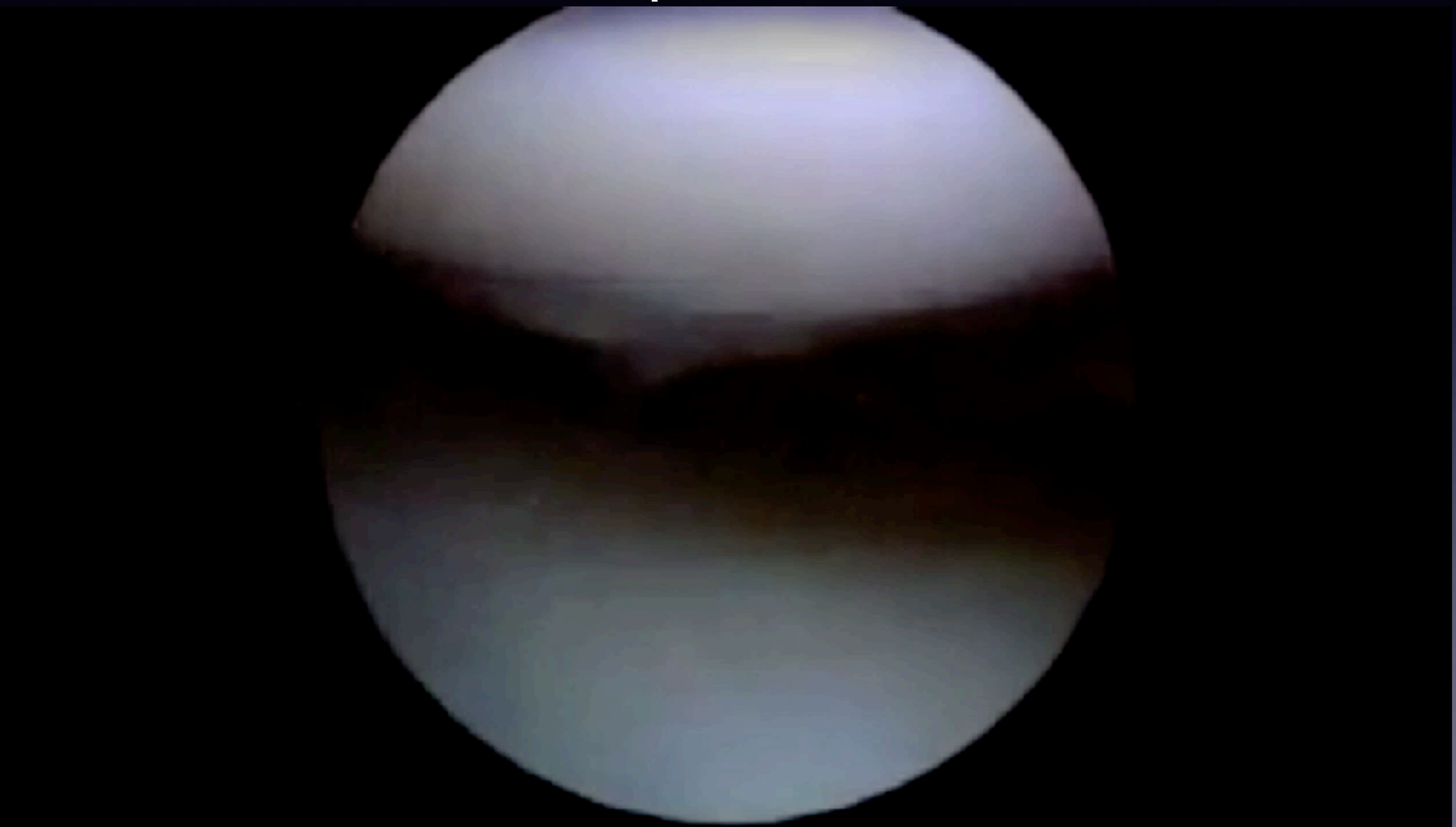
Extra-articular Reconstructions in the Treatment of ACL Tears

ACL Function



Pivot Shift

Pivot Shift - Lateral Compartment

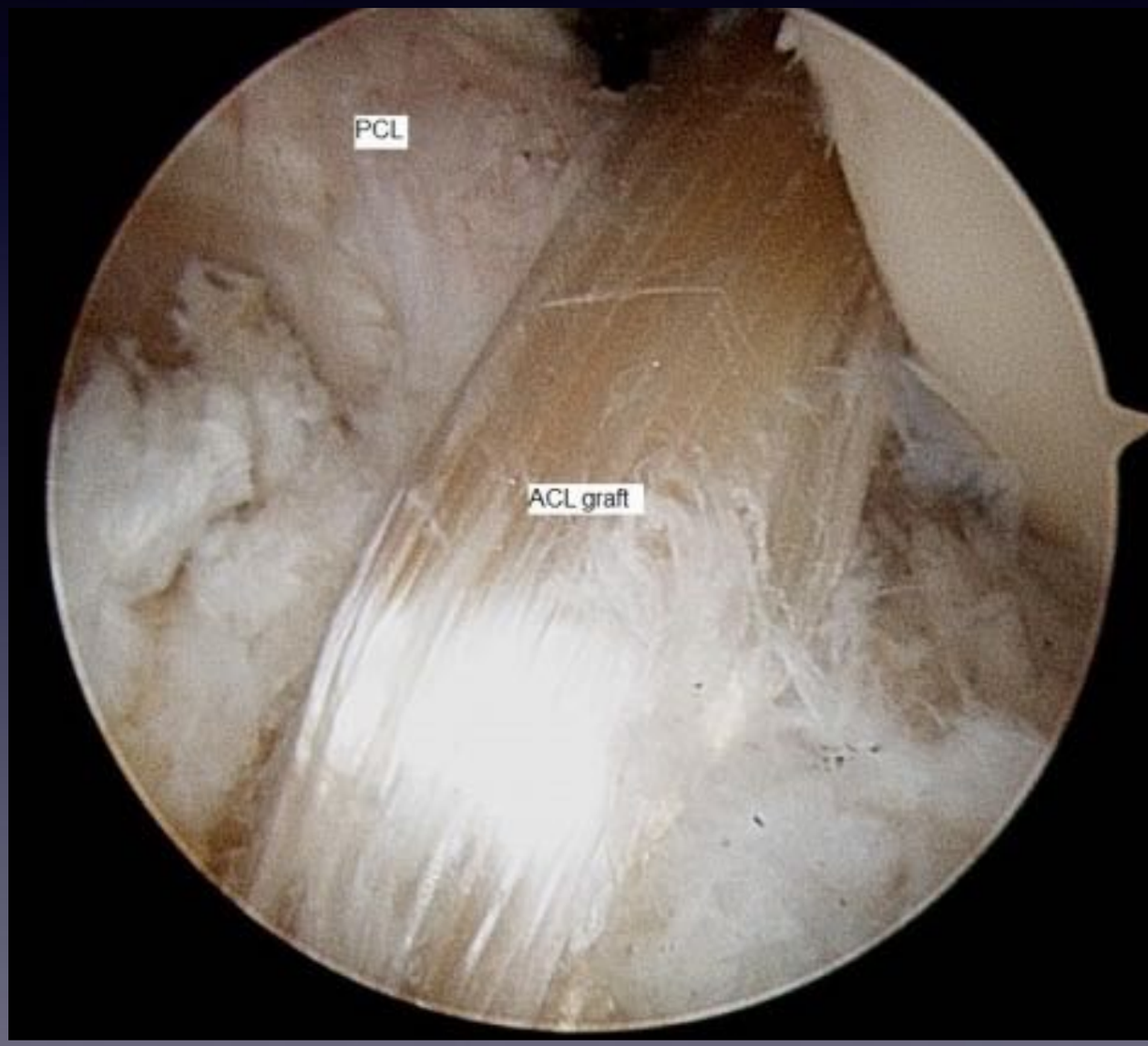


Intra-articular ACL Reconstructions

- Modern intra-articular ACL reconstruction, utilising patella tendon and hamstring tendon grafts, became the gold standard for ACL rupture treatment in the early 1980's, and continue to be so

- Good at controlling AP translation

- Not as effective for rotation



How Good Are We??!!

- Persistent anterolateral rotatory instability 22%-34%

Prodromos CC, Joyce BT, Shi K, et al. A meta-analysis of stability after anterior cruciate ligament reconstruction as a function of hamstring versus patellar tendon graft and fixation type. Arthroscopy 2005;21(10):1202.

Mohtadi N. Function after ACL reconstruction: a review. Clin J Sport Med 2008;18(1):105–6.

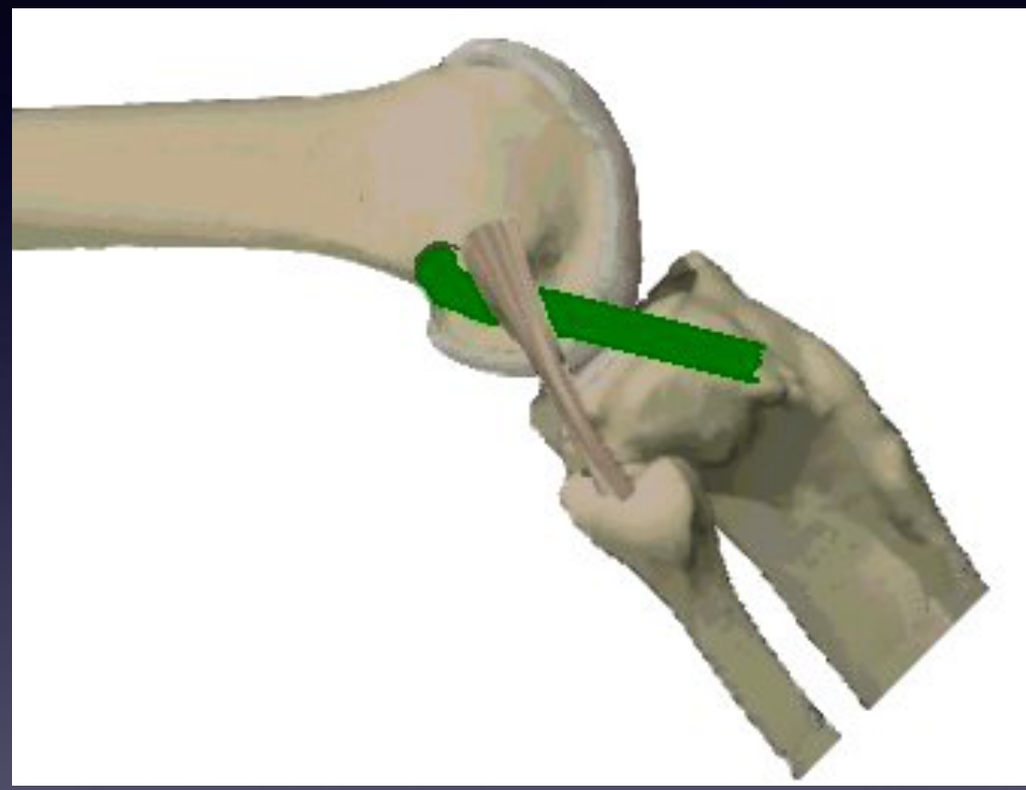
Graft Re-Rupture Rates

- Reported from 6%-25% (within 2-5yrs of ACL recon)

- High Risk Groups
  - 25% in patient under 25yrs (within 2 yrs)
  - Females
  - Hyperlaxity / hyperextension
  - High demand athlete

Lemaire Procedure

- Marcel Lemaire 1960 performed an extra-articular reconstruction on a professional dancer, as she had to quit her job.



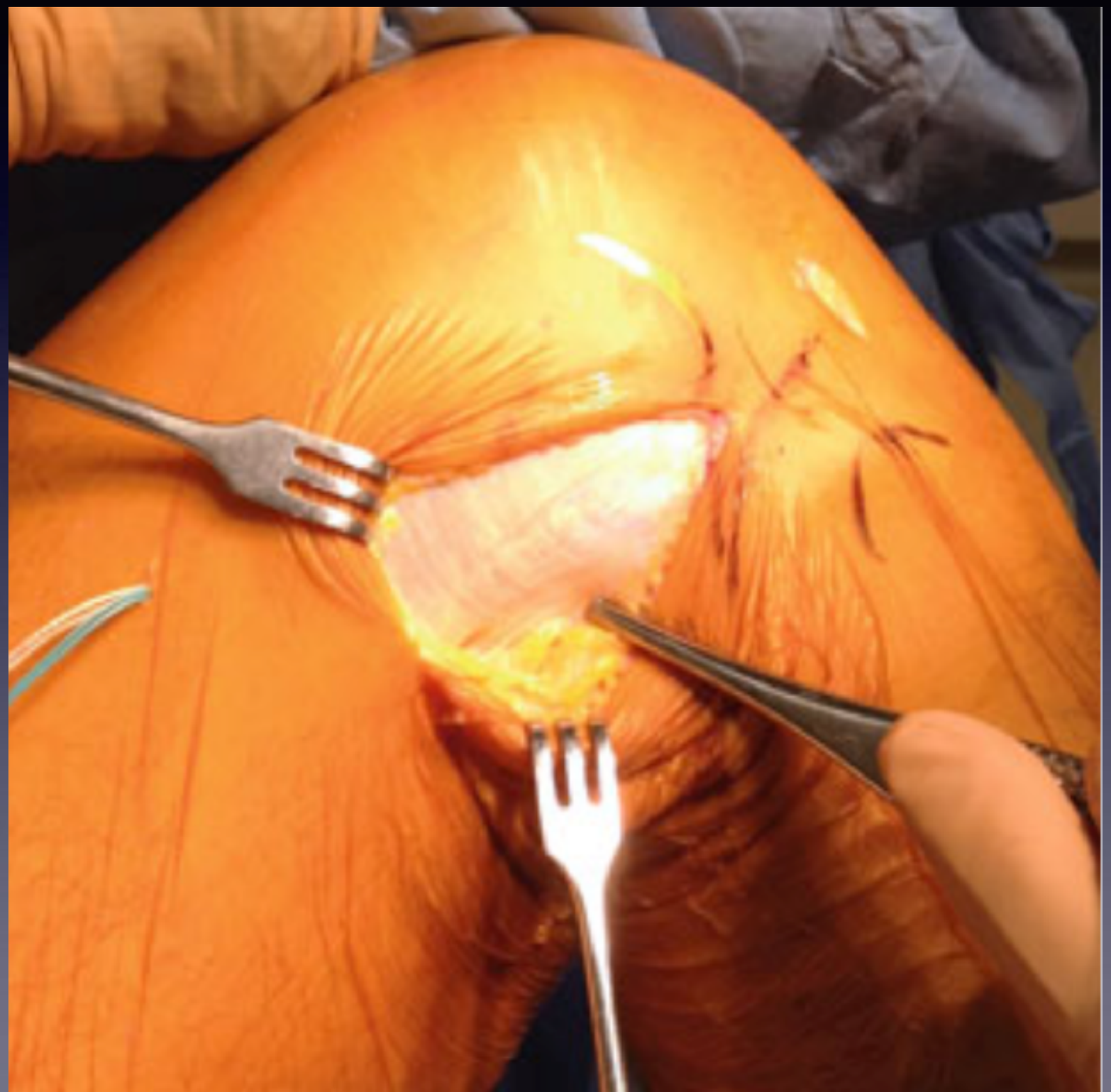
- He realised the major issue for her ACL deficient knee was rotatory instability

- ITB based lateral tenodesis

- Reasonable results. Does not control AP laxity. Poor with medial meniscal injury.

Lemaire

Lemaire



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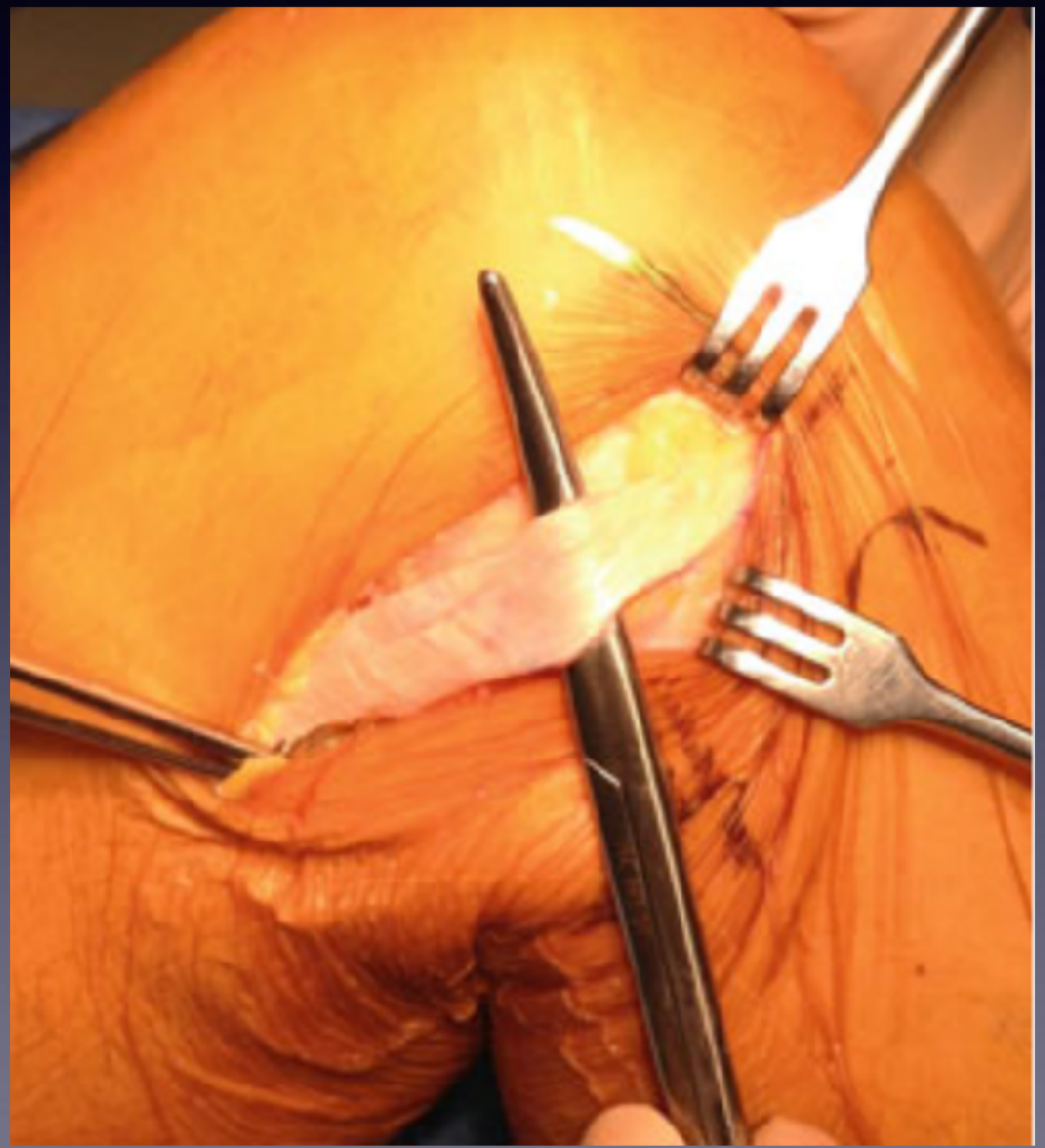

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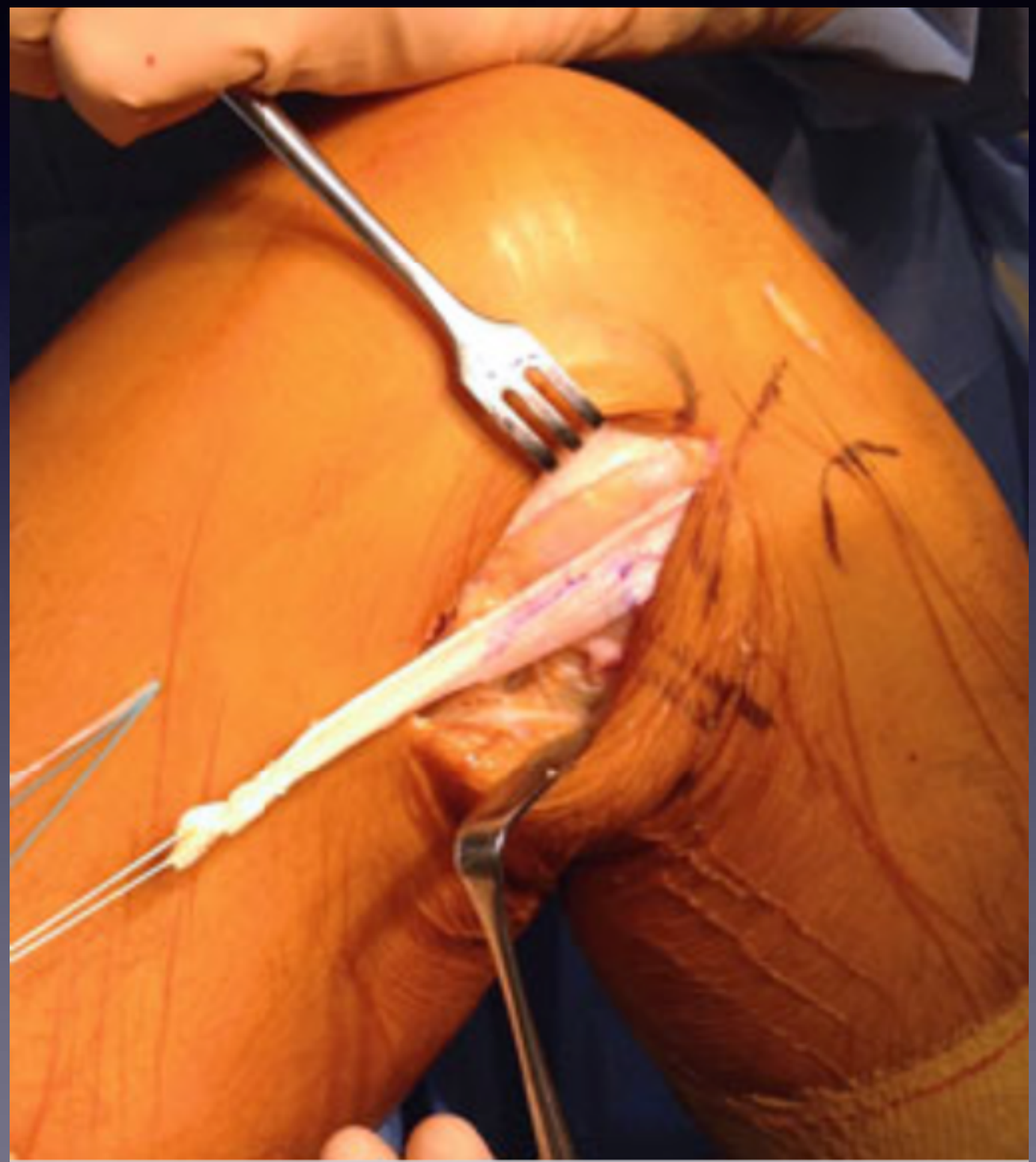

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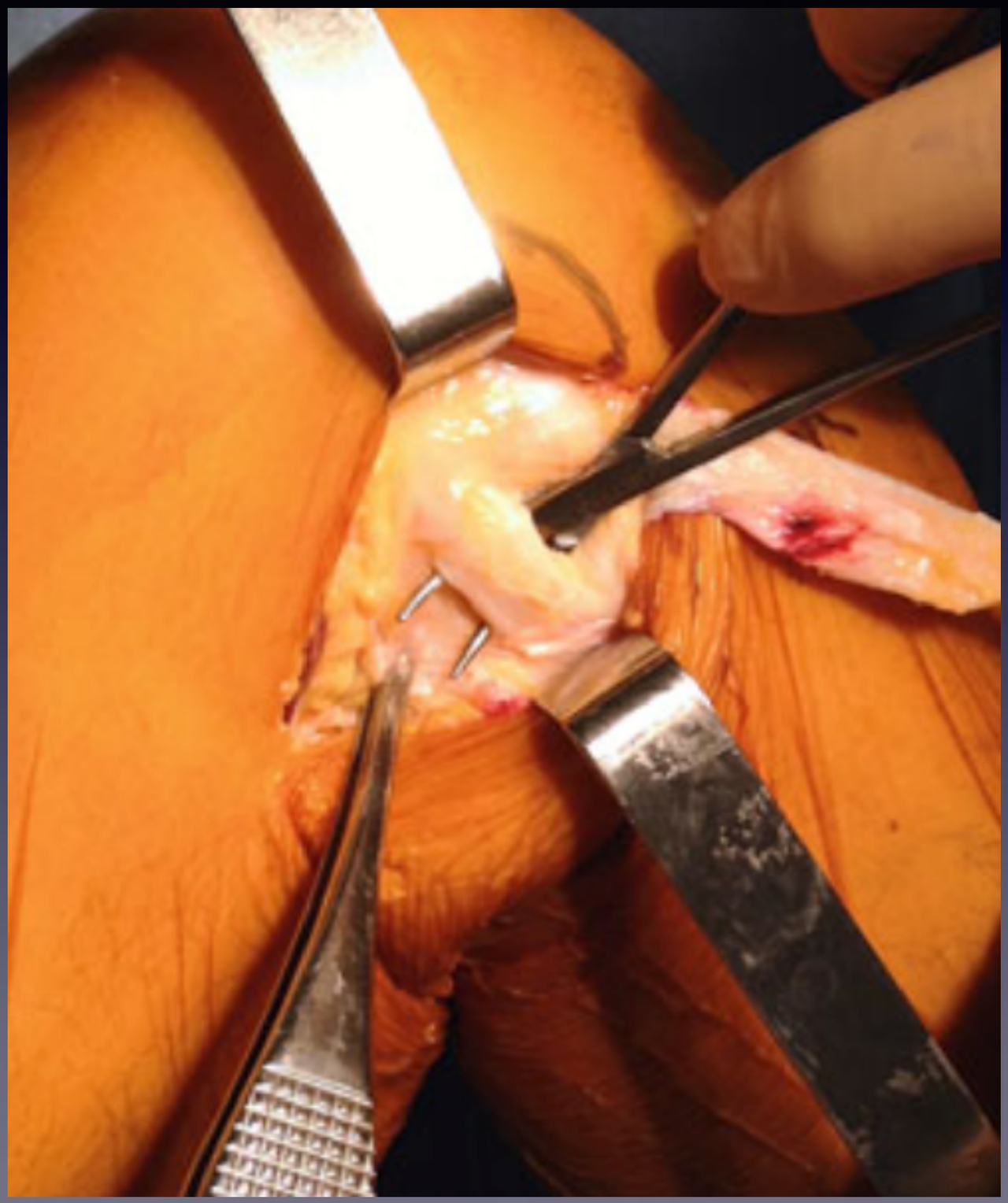

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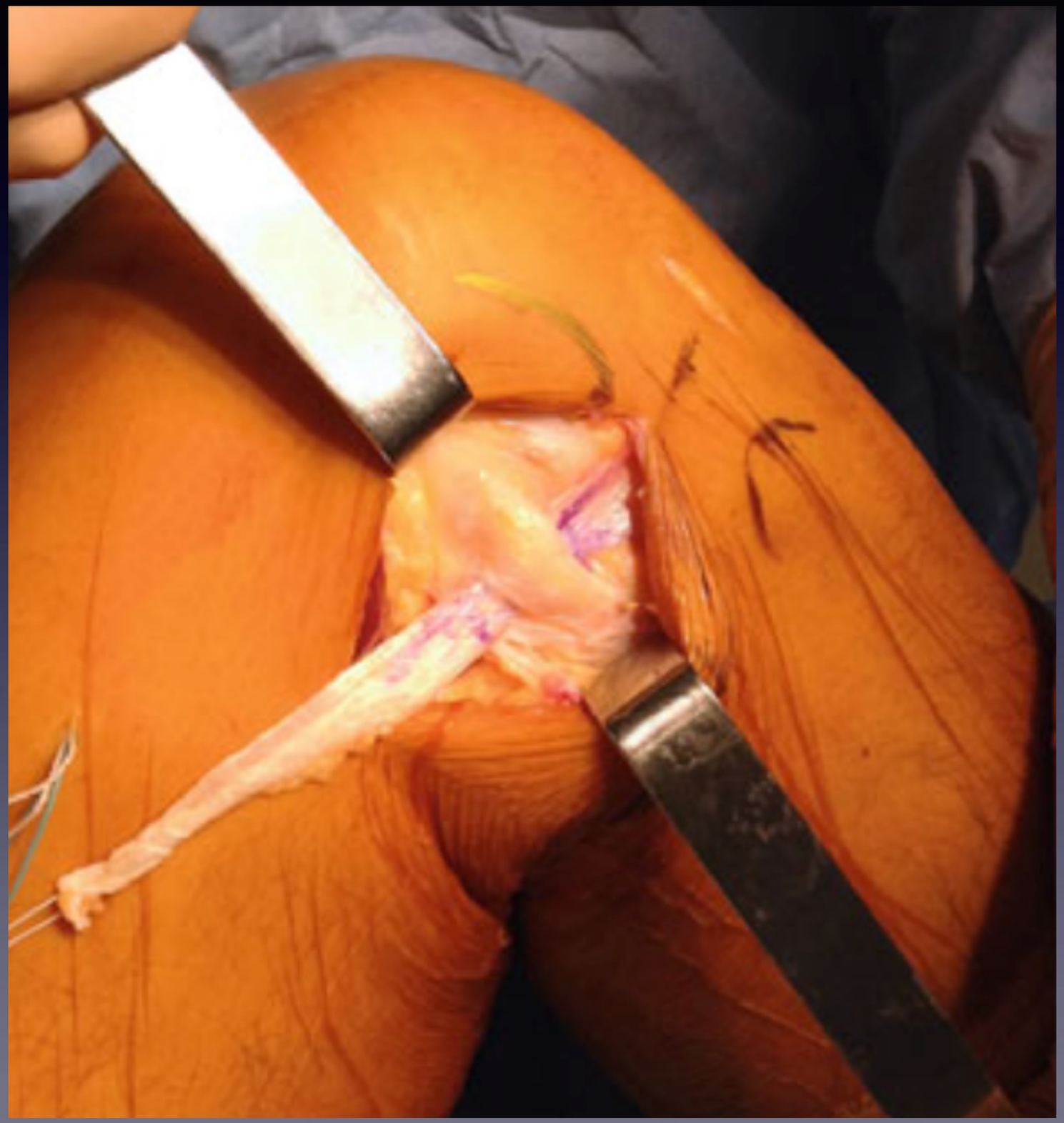

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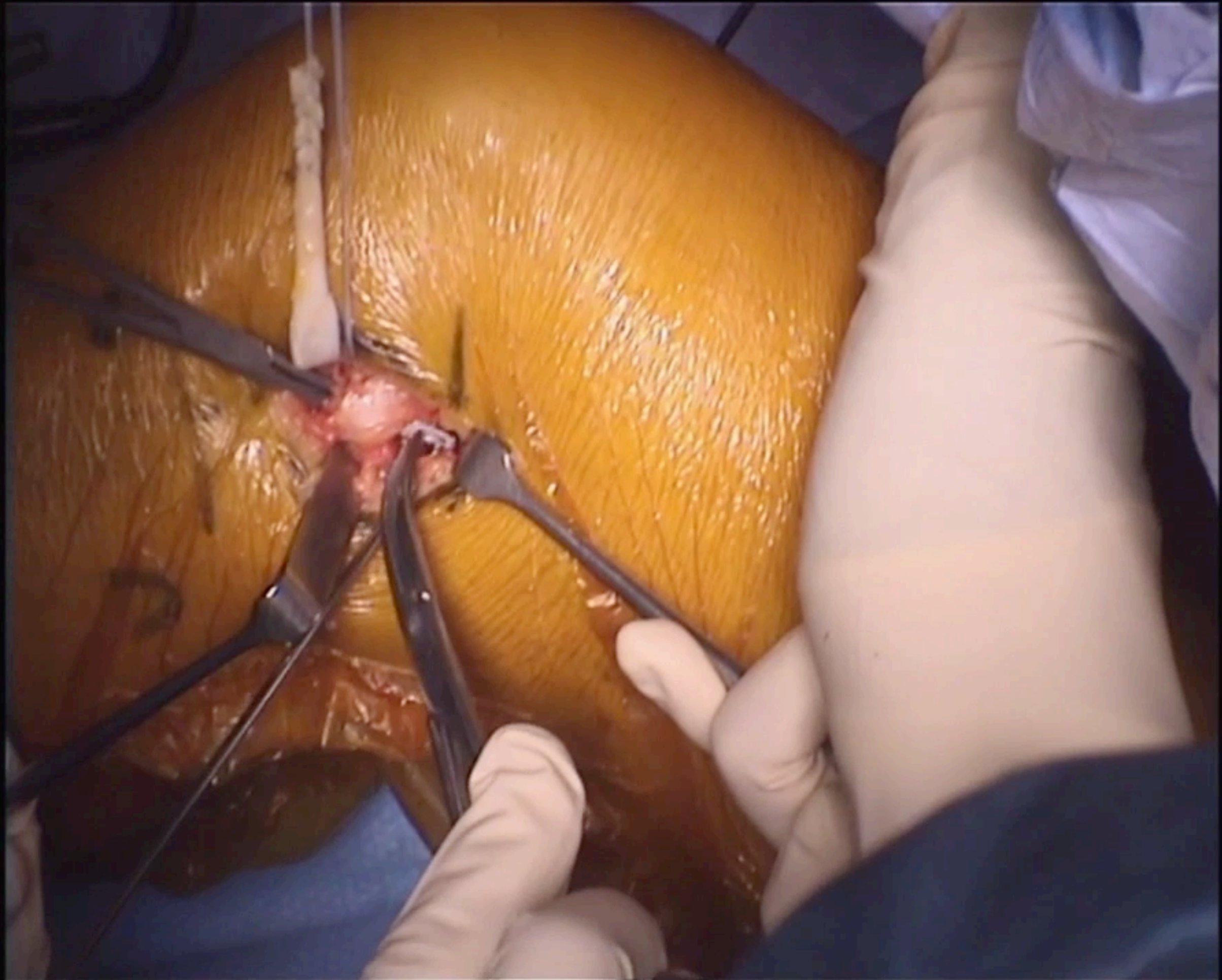

Post Operative Rehabilitation

- There is no change in the rehab programme with or without an extra-articular reconstruction

Combined ACL and Extra-articular Reconstruction

- Does combining the procedures help?

12TH Biennial ISAKOS CONGRESS 2019
Cancun, Mexico • May 12–16, 2019
International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine

Anterior Cruciate Ligament Reconstruction with or without a Lateral Extra-Articular Tenodesis: Assessment of Failure at Two Years from the ISAKOS Sponsored Stability Study

Alan Getgood, MD, FRCS(Tr&Orth), DipSEM, London, ON CANADA
Dianne M. Bryant, PhD, London, ON CANADA
Robert Litchfield, MD, FRCSC, London, ON CANADA
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Tim Spalding, FRCS(Orth), Coventry, West Midlands UNITED KINGDOM
Peter Verdonk, MD, PhD, Zwijnaarde BELGIUM
Devin Peterson, London, ON CANADA
Davide Bardana, MD, Kingston, ON CANADA
Alex Rezansoff, MD, FRCSC, Calgary, AB CANADA
Stability Study Group, MD, London, ON CANADA

- ISAKOS sponsored study (unbiased)
- Randomised
- 624 patients
- 2 yrs follow-up

12TH Biennial
ISAKOS CONGRESS 2019
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Anterior Cruciate Ligament Reconstruction with or without a Lateral Extra-Articular Tenodesis: Assessment of Failure at Two Years from the ISAKOS Sponsored Stability Study

- All patient under 25yrs old with complete ACL rupture
- Modified Lemaire procedure
- Required 2 of the following indications to be recruited
    - Gd 2 pivot shift or higher
    - Returning to high risk /pivoting sports
    - Generalised ligamentous laxity

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Anterior Cruciate Ligament Reconstruction with or without a Lateral Extra-Articular Tenodesis: Assessment of Failure at Two Years from the ISAKOS Sponsored Stability Study

- At 3 and 6 months, KOOS and pain scores favoured ACL alone
- At 12 and 24 months, there was no difference in patient reported outcomes

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Anterior Cruciate Ligament Reconstruction with or without a Lateral Extra-Articular Tenodesis: Assessment of Failure at Two Years from the ISAKOS Sponsored Stability Study

- Graft rupture at 2 yrs
    - ACL alone 11%
    - ACL and LET 4.5% ($p<0.001$)

Who I do Extra-articular Reconstructions On

- Host Factors
  - Young age (under 25 yrs 16.5% graft failure vs 8.5% over 25 yrs)
  - High demand athlete (RR 5.53 for ACL failure)
  - Ligamentous Laxity
  - Previous contra-lateral non contact ACL tear

- Pre-operative or Surgical Findings
  - Severity of pre-operative pivot shift
  - Medial meniscal injury
  - Segond fracture
  - MRI evidence of ALL/anterolateral capusle injury

- Surgical Technique
  - Revision ACL

Likelihood of ACL graft rupture: not meeting six clinical discharge criteria before return to sport is associated with a four times greater risk of rupture

Polyvios Kyritsis,[1] Roald Bahr,[1,2] Philippe Landreau,[1] Riadh Miladi,[1] Erik Witvrouw[1,3]

Table 1 Discharge tests and criteria used during the study period

Six-part return to sport tests	Discharge permitted when each of these criteria was met
Isokinetic test at 60, 180 and 300°/s	Quadriceps deficit <10% at 60°/s
Single hop	Limb symmetry index >90%
Triple hop	Limb symmetry index >90%
Triple crossover hop	Limb symmetry index >90%
On-field sports-specific rehabilitation	Fully completed
Running t test	<11 s

Criteria were set according to the literature at the start of the study.

T Test

Triple Cross Over Test

Likelihood of ACL graft rupture: not meeting six clinical discharge criteria before return to sport is associated with a four times greater risk of rupture

Polyvios Kyritsis,[1] Roald Bahr,[1,2] Philippe Landreau,[1] Riadh Miladi,[1] Erik Witvrouw[1,3]

- If patients met 6 specific criteria prior to return to sport they had1/4 the graft rupture risk

BrJSport Med 2016;50:946-951

Summary

- High risk patients undergoing an ACL reconstruction should consider extra-articular augmentation
- Appropriate rehabilitation reduces the risk of re-rupture